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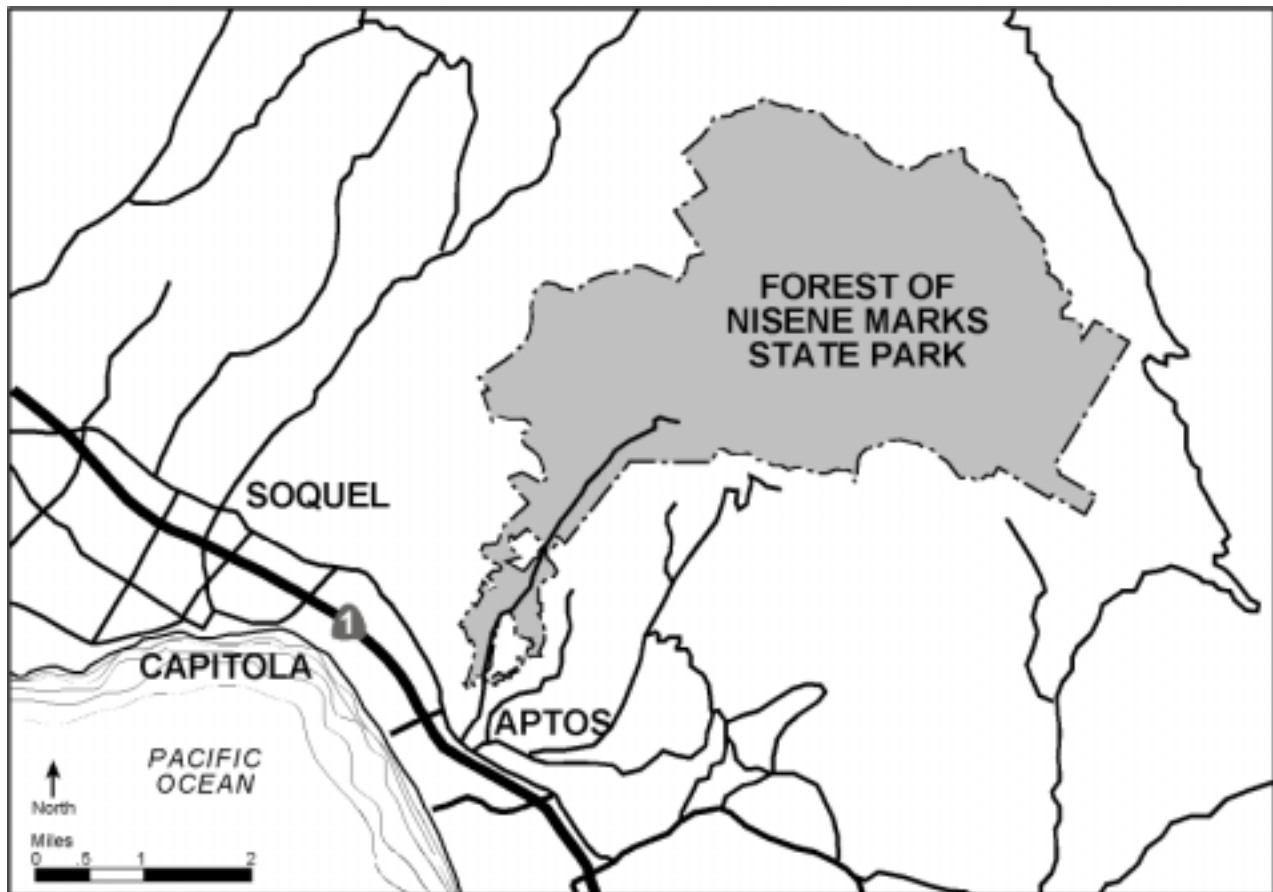
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**The Forest of Nisene Marks State Park
VICINITY MAP
FIGURE 1**

Introduction

A Quiet Forest Close to the City

First time visitors to The Forest of Nisene Marks State Park are often surprised to find this island of seclusion and serenity so close to the urban canyons of the San Francisco Bay Area. Located within an hour's drive of San Jose and ninety minutes from San Francisco, the Park is a perfect place to spend a day or week-end exploring a heavily-forested and diverse landscape. Even Santa Cruz County residents are often startled by the abrupt transition from the noise and traffic of nearby Aptos and the peace and solitude found only a mile up the Park's main access road. Overshadowed by nearby well-known and heavily-used parks like Seacliff State Beach, and Henry Cowell Redwoods State Park, the 10,036 acre Forest of Nisene Marks State Park offers an usual opportunity for the visitor wishing to bicycle, hike, or just sit beside the clear, flowing waters of Aptos Creek. And, for those wishing to hike beyond the sound of any voice save their own, there are trails steep and long enough to reward them with the quiet they seek. In fact, one can often find quiet places a mere hundred yards off the well-traveled main road into the Park.

A Rugged and Diverse Landscape

The dominant geographic feature of the Park is the Aptos Creek watershed that is almost entirely within the Park's boundaries. Combined with the Hinckley Basin to the north, the Park contains some of the most rugged landscapes in Northern California. There are places in the upper reaches of the Park that go for years and even decades without a human footprint. It was this forbidding landscape that blunted and delayed the forces of development that came everywhere else along the California coast. The twisted ridges and steep canyon walls echo the tectonic forces of the faults that crisscross the watersheds. The landscape is continually in motion, being continually cut down by rainfall while being lifted and twisted by the San Andreas and Zayante faults beneath the earth. The most recent reminder of these forces came on the afternoon of October 17, 1989 when the earth convulsed miles beneath the Park causing widespread death and destruction throughout the greater San Francisco Bay Area in what became known as the Loma Prieta Earthquake.

This diverse landscape offers a complex mosaic of plant and animal communities. Though it is best known for its second growth redwood forest, the Park includes a mixture of conifers and hardwoods. In some places, within a matter of footsteps, one can move out of the darker redwood forest into chaparral, open meadow and wetlands. These diverse plant communities harbor an equally diverse number of animal communities, including deer, raccoons, bobcats, and cougars along with a wide variety of birds, reptiles and amphibians. There are also a number of introduced animal species including wild pigs and plants such as eucalyptus, forget-me-nots and Monterey pines.

A Humanized Landscape

The human imprint on the Park's landscape is almost equal to that of nature's. Everywhere one looks there are stumps, railroad cuts, trestle footings, and pieces of cable that speak of an era when the sound of loggers drowned out all else. Visited infrequently by the Ohlone

Indians and the early Spanish-speaking residents of the coast, it was not until the 1850s that Yankee immigrants began to enter the Aptos Creek canyon to cut oak firewood and make shakes and lumber out of the redwood trees closest to the coast. The steep, narrow canyons continued to protect the upper areas of the watershed until the early 1880s. It took the economic muscle of California's most powerful corporation, the Southern Pacific Railroad, to finally force open the redwood treasure box of the upper Aptos. Chinese railroad workers cut, graded and laid a standard gauge railroad over seven miles into the canyon, their sweat and muscle memorialized in the huge cuts and fills which embrace the Park's only road to this day. Eventually, between 1883 and 1923, over 150,000,000 board feet of lumber flowed down the railroad line and out to markets the world over. Their work finished, the loggers abandoned their buildings, pulled up the railroad rails, leaving behind a scarred and brutalized landscape.

For the next thirty years, while the forces of development swept across the Santa Cruz County coast, the Aptos Canyon slowly healed. The resilient and magical redwood stumps sprouted a second forest and the outline of Douglas fir, oak and madrone once again softened the jagged ridges.

The Marks Family Legacy

Finally, in the early 1950s, the land caught the attention of a Salinas Valley farming family including Nisene Marks and her adult children. Between 1951 and 1954 the Marks bought most of the Aptos Canyon and combined it with several adjacent parcels to create a holding of approximately 9,000 acres. Following Nisene's death in 1955, her children decided to create a park as her living memorial. In the early 1960s, the Nature Conservancy took an option on the property, and in 1963 the land was deeded, with restrictions, to the State of California. One stipulation was that the Park bear the name of Nisene Marks, the woman who instilled the sense of stewardship in her children.

Over the next four decades, with the assistance of Save-the-Redwoods League, Sempervirens Fund and other generous and far-sighted donors, the Park was expanded by the addition of approximately 1,000 acres. Meanwhile, protected by the Department of Parks and Recreation, the land continued to heal and the scars of the logging era became faint. Winter storms such as the huge flood of January 1982 swept many of the buildings out to sea, while earthquakes like the Loma Prieta of 1989 continued to erase the century-old railroad cuts and grades.

The Spirit of The Forest of Nisene Marks State Park

The Forest of Nisene Marks State Park is a forest in recovery. Each year the marks of the forty-year logging frenzy grow more faint as the redwoods push ever higher. Yet, the visitor cannot help but notice the huge stumps with their springboard notches, the building foundations, the railroad grades, and the trestle footings that remind of the time when human ingenuity forced its way into these canyons to extract the natural treasures that grew there. Cultural and natural forces are forever interwoven on this landscape. The over-arching interpretive theme that this park offers is one of optimism and hope. Despite being brutally assaulted, the landscape can regenerate itself. When given the proper interpretive guidance, the visitor can be helped to understand that they are strolling through a landscape that is

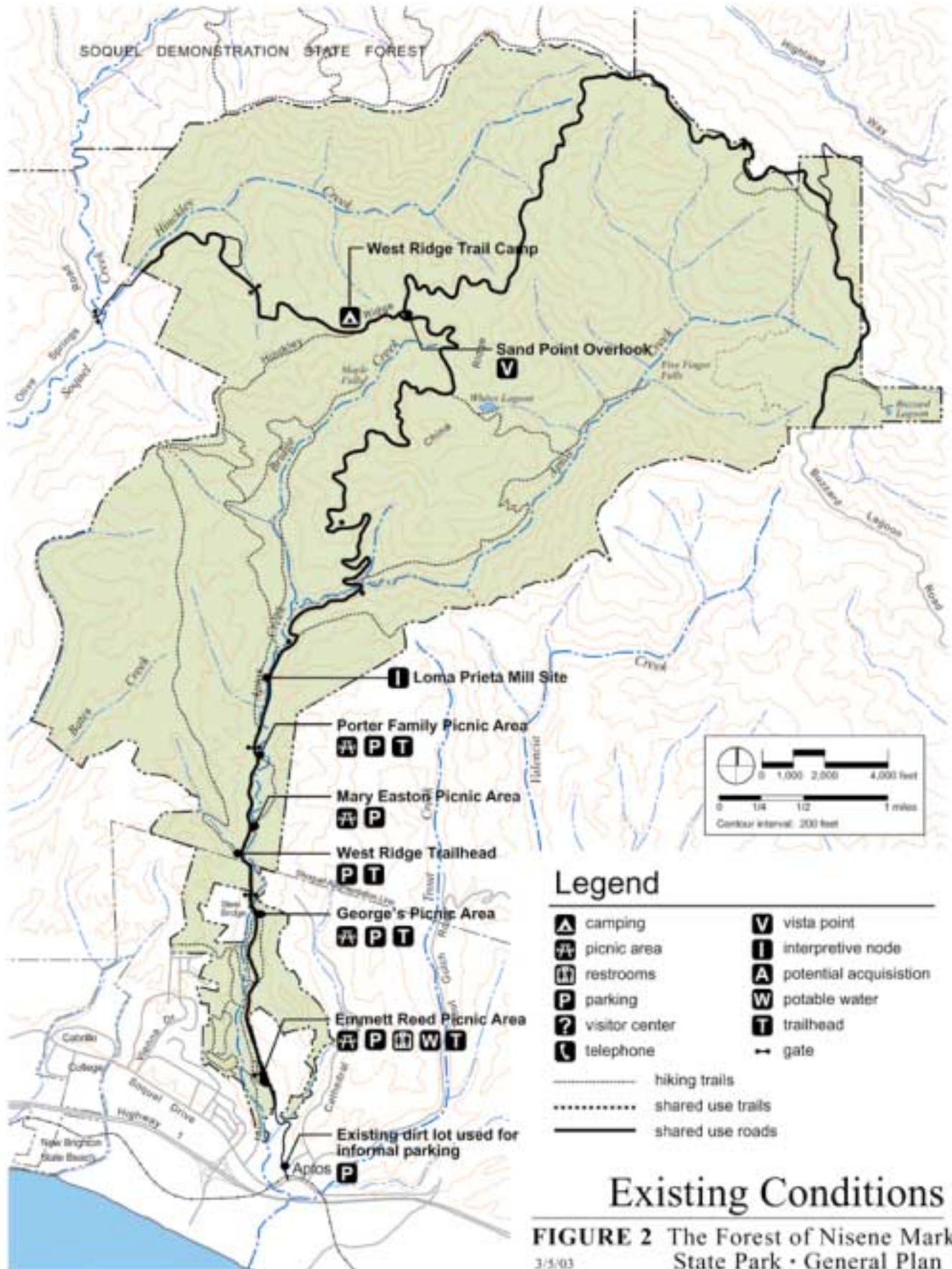
continually healing. The lesson offered here is that humans have the ability to change their relationship with the land from one of exploitation to one of management and stewardship.

Purpose of this General Plan

The general plan is the primary management document for a unit of the State Park System, establishing its purpose and a management direction for the future by providing a defined framework for a unit's development, ongoing management, and public use. Thereafter, this framework assists in guiding daily decision-making and serves as the basis for developing more detailed management and site-specific project plans.

This document was prepared to satisfy the requirements of the California Public Resources Code (PRC) Section 5002.2. The PRC specifies that a general plan will be prepared prior to development of any new facilities and shall consist of elements of discussion that will evaluate and define the proposed management of resources, land uses, facilities, concessions, operation of the unit, and any environmental impacts. The Forest of Nisene Marks State Park General Plan must be submitted to the State Park and Recreation Commission for approval.

The General Plan for The Forest of Nisene Marks State Park provides a vision for the Park. Although broad in scope, the plan does identify and analyze park resources in order to provide an assessment of potential environmental impacts as a result of the plan's implementation. In order to do so, the plan recommends the development of a comprehensive trails plan, and a resource management plan that will guide future needs. These guidelines propose improvements for land use compatibility, the nature and location of possible future developments, possible acquisition, and other specific actions.



Existing Conditions and Issues

Existing Land Use

The Forest of Nisene Marks State Park comprises approximately 10,036 acres of predominately undeveloped, second growth redwood and mixed evergreen forest, chaparral, and grasslands near the town of Aptos in southern Santa Cruz County. The Park includes over 40 miles of multi-use and single-use trails. Activities within the Park include but are not limited to hiking, biking, walking, running, equestrian use, and nature interpretation and education. Located within the Park are picnic areas, a backpacker campground, and interpretive historic sites. Easements on the Park provide right-of-way for water pipelines, overhead power lines and roads.

Regional Land Use

Residential and associated uses dominate the surrounding area. The Soquel Demonstration State Forest is located along the upper boundary of the Park. Cabrillo College is close to the lower western boundary. The Aptos watershed, almost all of which is within the Park, ultimately flows to the ocean at Seacliff State Beach. Other nearby units of the State Park system include New Brighton State Beach, Manresa State Beach, Sunset State Beach and the recently acquired Castro Adobe.

Soquel Demonstration State Forest

The Soquel Demonstration State Forest, adjacent to the Park's northern boundary, includes 2,681 acres used to promote sustainable logging and compatible recreation. Demonstration State Forests provide research and demonstration projects on forest management, while providing public recreation opportunities, fish and wildlife habitat, and watershed protection. State Parks works closely with the Soquel Demonstration State Forest, especially in the area of regional trail connections. Currently there is one access point between the two facilities, which allows trail users access to both properties.

Cabrillo College

Cabrillo College, a 162-acre campus bordering the lower west side of the Park, is located on Soquel Avenue. Approximately 13,500 students enroll each fall and spring semester, with an additional 3,000 enrolling in summer sessions. State Parks is interested in educational opportunities that can be provided in partnership with Cabrillo College. Thus far there has only been a limited demand for recreational access from Cabrillo College into the Park. Opportunities for such access will be considered where appropriate.

Uvas Canyon County Park

Uvas Canyon County Park, operated by the Santa Clara County Parks, is approximately 1,200 acres located in upper Uvas Canyon on the eastern side of the Santa Cruz Mountains. This park offers activities such as hiking, camping, biking, and picnicking. There are seven miles

of hiking trails, individual picnic and campsites, and several camping areas available for reservation by groups larger than 40 people. State Parks is interested in trails and biological corridors that might connect The Forest of Nisene Marks State Park with the Uvas Canyon County Park should property become available from willing sellers.

Seacliff State Beach

Seacliff State Beach located on the Monterey Bay is a favored spot for swimming, picnicking, sightseeing, camping and fishing. The focal point of the beach, although closed to public access, is the concrete freighter known as the Palo Alto. On site are a picnic facility and an interpretive center. Seacliff State Beach is located off Highway 1 on the State Park Drive exit. Public access from The Forest of Nisene Marks State Park to Seacliff State Beach is not possible along Aptos Creek. However, State Parks recognizes the value of owning most of this watershed and will seek ways to interpret and educate the public on what is occurring in this watershed from its origins to its mouth.

Residential Developments and Inholdings

Residential inholdings are located within the perimeter boundary of the Park. Scattered multi-family and single-family residences and schools are located within a mile of the Park, such as those along Corralitos Creek east of Buzzard Lagoon and west of the Park near Millpond Lake, Kennolyn Camp, and along Glen Haven Road. Many of the residents within a mile of the Park are located south of the Park in Porter Gulch, Monte Toyon, and Trout Creek Gulch.

Aptos Village

A small commercial development, known as Aptos Village is located at the lower end of The Forest of Nisene Marks State Park. The village is mostly comprised of retail outlets, food service and some lodging. The vacant lot behind the village has historically been used for overflow parking from hikers, bikers and joggers desiring access to the Park. This lot is privately owned and may be further developed in the future. Santa Cruz County is currently engaged in a planning effort to update the master plan for this development. State Parks owns portions of Aptos Creek Road, which allows access to the Park and this development. The entrance at Soquel Drive, signage and parking solutions remain issues for the Department in this area.

Physical Resources

Topography

The Santa Cruz Mountains form the mountainous spine of the San Francisco Peninsula and extend from Daly City in the north, 80 miles southeast to the Pajaro River, near Watsonville, where it merges with the southern Gabilan range. The maximum elevation of the Santa Cruz range is about 3,800 feet in elevation, but the average summit height reaches 2,500 feet in elevation. The terrain of The Forest of Nisene Marks State Park is dominated by ridges and canyons created by the fault lines that run through the property (Figure 3). Within the Park, Santa Rosalia Mountain is approximately 2,500 feet in elevation and comprised of five peaks equal in height. These peaks form three ridges that dominate the Park's topography. Santa

Rosalia Ridge marks the northwest boundary of the Park, while China Ridge lies in a general northeast-southwest orientation and extends three and a half miles from Santa Rosalia's highest elevations to the convergence point of Aptos and Bridge Creeks. Hinckley Ridge begins at Sand Point (elevation 1,600 feet) and extends westward to the convergence of Bates Creek.

Climatology

Although the climate of the Santa Cruz Mountains is moderated by proximity to the Pacific Ocean, it varies over relatively short distances due to the diverse topography. An increase in elevation and distance from the coast generally corresponds to an increase in precipitation and temperature maxima/minima. Winters are typically cool and wet, while summers are dry and warm to moderately hot. Heavy frost and occasional snow blanket the Park in winter. Annual rainfall within the Park varies from 30 to 65 inches per year and typically falls between November and May.

Summer fog is an important component of the Park's climate, especially at lower elevations. Summer coastal fog usually dominates the area of the Park up to 1,000 feet in elevation. Summer temperatures in this lower portion of the Park range from 50 degrees Fahrenheit in the morning to 75 degrees Fahrenheit mid day. Within the upper reaches of the Park (above 1,500 feet in elevation), temperatures range from 40 degrees Fahrenheit in the morning to over 100 degrees Fahrenheit mid day.

Hydrology, Floodplains and Water Quality

Regional Hydrology

The Santa Cruz Mountains, like most of central California, are marked by winter rains and dry summers. The streams on the west side of the Santa Cruz Mountains drain relatively small watersheds. Most of the streams draining the west side of the Santa Cruz Mountains flow through steep-walled canyons to the Pacific Ocean. These streams tend to exhibit "flashy" (rapidly rising and falling) winter flows in response to storm events, which themselves are intensified by the orographic effect of the mountains. As the dry season progresses and the soil dries out, the streams continue to be fed by seeps and springs. Summer "base" flow at any point in a stream is therefore reflective of the cumulative rate of emergence of groundwater into the stream channel.

Hydrology of the Park

Santa Rosalia Ridge, China Ridge and Hinckley Ridge divide the Park both topographically and hydrologically. The perennial streams in these areas originate within the Park, and are composed of numerous tributaries which form in the Park's upper elevations before merging together in steep canyons.

The eastern most tributaries of Hinckley Creek originate along the western facing slopes that mark the convergence of Santa Rosalia and China Ridge, with additional tributaries draining the northern slopes of Hinckley Ridge. Hinckley Creek flows westward, and eventually joins with Soquel Creek approximately 2,000 feet west of the Park's boundary. The southern

slopes of Hinckley Ridge drain into Bridge Creek, which joins with Aptos Creek at the southern terminus of China Ridge. Aptos Creek has numerous tributaries which originate in Santa Rosalia and the southern slopes of China Ridge.

Streamflow data for Aptos Creek was collected by USGS between 1971 and 1985; the sampling station was located in the southern portions of the Park, representing a drainage area of approximately 10.2 square miles. The peak daily flow was recorded at 3,980 cubic feet per second (ft³/s) during January 1982. The highest average mean monthly streamflow was 28.8 cubic feet per second (ft³/s) during the month of February, with the lowest streamflow averages in September of only 1.45 ft³/s (USGS, 2001). These flow volumes are reflective of the wet winter and dry summer regional climatic cycles.

Flooding

The project site is located outside the 100-year flood zone and 500-year flood zones, as designated by the Federal Emergency Management Administration's (FEMA) National Flood Insurance Program (FEMA, <http://www.esri.com/hazards/>).

Water Quality

The California Regional Water Quality Control Board, Central Coast Region (RWQCB) is responsible for protecting and regulating water quality in the Park and the surrounding region. The RWQCB has developed a *Water Quality Control Plan* (Central Coast Regional Water Quality Control Board, 1994), often referred to as the Basin Plan, that designates beneficial uses for significant water resources in its regulatory region. Beneficial uses of surface and groundwater serve as a basis for establishing water quality objectives and discharge prohibitions. The Forest of Nisene Marks State Park is located within the Aptos Creek watershed, and surface waters within the Park have numerous beneficial uses designated by the RWQCB in the current Basin Plan (refer to Appendix A).

The Coastal Watershed Council has performed volunteer weekly water quality testing in Aptos and Valencia Creek since May 1999. The purpose of sampling activities is to determine compliance with water quality objectives set for in the Basin Plan and to gather data pertinent to the anadromous fisheries present in these creeks (Coastal Watershed Council, 2000). Four locations are sampled, with the furthest upstream sample on Aptos Creek collected at Steel Bridge within the Park. Air and water temperature are tested, and water samples are analyzed for dissolved oxygen, turbidity, conductivity, and pH. Water quality testing results are summarized in Table 1, together with corresponding water quality objectives set forth in the Basin Plan. The testing has not shown any problems with water quality with respect to the four parameters measured.

Soil Erosion

Erosion and subsequent sedimentation problems within the Park are primarily associated with areas of bare soils, for example trails and roads. The area below the Porter Picnic Area has trails in or near the creek drainage which show some erosion. The trails along the flats above the creek have a reduced amount of ground vegetation, increasing the amount of bare ground susceptible to erosion.

Groundwater

The Park is located in the Soquel Valley groundwater basin (Central Coast Regional Water Quality Control Board, 1994). Groundwater is considered suitable for agricultural water supply, municipal water and domestic water supply, and industrial use.

Geology, Geohazards, and Soils

Stratigraphy

The Forest of Nisene Marks State Park lies within the Coast Ranges geomorphic province.¹ This 900-mile long province stretches along the Pacific Ocean from Southern California to the Oregon border, and is characterized by discontinuous northwest-trending mountain ranges, ridges, and intervening valleys composed of volcanic and ancient seafloor sedimentary rocks. Bedrock exposed within the Park are sedimentary rocks formed when the area was submerged under shallow seas and erosion of the surrounding uplands deposited sand, silt and gravel onto the shallow seafloor. These marine sedimentary rocks have subsequently been deformed as a result of the tectonic and compressional forces associated with the strike-slip movement of the San Andreas Fault and uplift of the Santa Cruz Mountains.

The youngest and most prominently exposed sedimentary rock type is the Phocene Purisima Formation that underlies the southwest half of the Park as shown in Figure 5. The Purisima is a thick yellowish-gray siltstone containing lenses of sandstone. This is a relatively young geologic unit and therefore tends to be less consolidated, easier to weather, and susceptible to landsliding especially within stream canyons. The majority of landslides associated with the 1906 San Francisco and 1989 Loma Prieta earthquakes occurred in areas overlaying the Purisima Formation. A major structural feature within the Purisima Formation is the Glenwood Syncline, which is a concave upward fold in the earth caused by tectonic compression. The Glenwood Syncline is typical of the fold belts that have formed in this area.

Northeast of the Purisima Formation is a series of sedimentary rocks that become increasingly older and more tightly folded structurally toward the eastern portion of the Park. Underlying the Purisima is the Lambert Shale and Vaqueros Sandstone. The Vaqueros Sandstone contains small inclusions of Zayante Sandstone. Northeast of this are the San Lorenzo Mudstone and the upper and middle units of Butano Sandstone and siltstone. In general the older sedimentary rocks outcropping in the northeast portion of the Park are better cemented sandstones and siltstones that are more consolidated and massive, and therefore more resistant to weathering and slope failure. In the northeast corner of the Park is an additional exposure of the younger Purisima Formation. The San Andreas Fault, which denotes the park's northeastern border, forms the boundary between the Purisima Formation and the Mount Pajaro shale located just outside of the Park.

¹ A geologic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geologic provinces.

Seismicity

The Coast Ranges of California contain both active and potentially active faults² and are considered a region of high seismic activity. The 1997 Uniform Building Code (UBC) locates the entire Bay Area, including the Santa Cruz and Capitola area, within Seismic Risk Zone 4. Areas within Zone 4 are expected to experience maximum magnitudes and damage in the event of an earthquake (Lindeburg, 1998). The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of Richter magnitude 6.7 or higher occurring in the San Francisco Bay Area within the next 30 years. The result of the evaluation indicated a 70 percent likelihood that such an earthquake event will occur in the Bay Area between 2000 and 2030 (USGS, 1999).

Regional Faults

The San Andreas Fault Zone to the east and the San Gregorio Fault Zone to the west represent the two principal active faults within the region and in proximity to the Park (Figure 5). These faults are known as right-lateral strike slip faults or those with principal movement parallel to the trend of the fault.

San Andreas Fault Zone. The San Andreas Fault Zone extends nearly the entire length of California and marks the plate boundary between the North American plate to the east and the Pacific plate to the west. The San Andreas is not represented by a single trace, but by a system of active faults that diverge from the main fault south of San Jose. Two of the active faults included in this San Andreas Fault “System” are the Calaveras and Hayward faults. These two faults extend through the eastern side of the San Francisco Bay. The main trace of the San Andreas follows a northwest trend cutting through the Santa Cruz Mountains and continuing along the eastern side of the San Francisco Peninsula, eventually crossing the northeast corner of the Park. One dramatic surface expression of the San Andreas exists between Pacifica and San Mateo where Crystal Springs Reservoir and San Andreas Lake clearly mark the rupture zone.

Locally, the San Andreas Fault was responsible for the great 1906 San Francisco earthquake (Magnitude 7.8) and the recent 1989 Loma Prieta earthquake (Magnitude 6.9). The 1989 epicenter of the Loma Prieta earthquake and right lateral and a vertical component were located within The Forest of Nisene Marks State Park. During recorded history, numerous California earthquakes of magnitude greater than a magnitude 6.5 have occurred on this fault from Los Angeles to Point Arena.³

² An active fault is defined as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). Surface displacements are observable and can be measured either from rock outcrops or within a trench dug across a fault trace. A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. “Sufficiently active” is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).

³ Magnitudes herein are expressed as Moment Magnitudes. Moment magnitude is related to the physical size of a fault rupture and movement across a fault while Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CDMG, 1997). The concept of “characteristic” earthquake means that we can anticipate, with reasonable certainty, the actual damaging earthquake that can occur on a fault.

San Gregorio Fault. The San Gregorio Fault Zone is made up of several shorter faults and extends roughly parallel to the coast of California about 270 miles from the vicinity of Bolinas Bay south to Monterey Bay, representing the westernmost zone of active faulting in the San Francisco Bay Area. The Palo Colorado fault mapped by Jennings (1994) to extend from the center of Monterey Bay about 24 miles to Big Sur may be a segment of the San Gregorio Fault Zone. The San Gregorio continues south through Big Sur and eventually connects with the Hosgri Fault Zone in the south-central portion of the state.⁴ Except for two small segments that pass through land, the San Gregorio Fault Zone remains offshore from San Francisco to Santa Cruz, and is about 2 miles offshore from The Forest of Nisene Marks State Park. These previously mapped onshore active fault segments are the Seal Cove fault that comes onshore at Pillar Point near Half Moon Bay and two parallel segments that come onshore at Pescadero Point. Previous studies have referred to these parallel strands as the Frijoles strand and the Coastways strand (Sedlock, 1998). While the other major faults in the San Francisco Bay Area have produced earthquakes greater than Magnitude 6.0, the San Gregorio has not provided scientists observable evidence of displacement on this fault. The 1989 Loma Prieta Earthquake did not appear to trigger secondary movement on the San Gregorio Fault Zone. The right-lateral “slip” or movement on San Gregorio is widely estimated to be between 1 to 10 millimeters per year (mm/yr) (Sedlock, 1998). Data on epicenters recorded in historic times indicate three small earthquakes, magnitudes ranging from 5.5 to 5.9, occurring offshore of The Forest of Nisene Marks State Park between 1869 and 1931. Two larger earthquake (Magnitude 6.0 to 6.4) occurred offshore of Carmel during the same time period (Toppozada, Branum, Peterson, Hallstrom, Cramer, and Reichle, 2000).

Zayante Fault. Unlike the active faults in the region that have exhibited movement in historic time or within the last 11,000 years, the Santa Cruz Mountains contain many small inactive faults that occur in isolated exposures. However, the Zayante Fault is traceable beyond localized areas and displays some minor level of displacement. This fault is not well-exposed regionally and its trace has been mapped primarily by offset of rock outcrops. The Zayante Fault crosses the Park through Hell’s Gate in Aptos Creek Canyon, although the exact location of the fault is unclear and obscured by thick vegetation. The Zayante Fault is considered a potentially active fault within the Park and shows evidence of movement within the last 1.6 million years. (Jennings, 1994). Farther south, portions of the Zayante Fault around Pajaro and Watsonville are classified as active. These type faults have the potential of activity especially secondary movement related to movement on the San Andreas.

Earthquake Intensity

Strong ground movement from a major earthquake could affect The Forest of Nisene Marks State Park within the next 30 years. Ground shaking may affect areas hundreds of miles distant from the earthquake’s epicenter. Earthquakes on the active faults in the region are expected to produce a range of ground shaking intensities at the property. The estimated (moment) magnitudes identified in Table 2 represent characteristic earthquakes on particular faults.

While the magnitude is a measure of the energy released in an earthquake, intensity is a measure of the ground shaking effects at a particular location. Ground movement intensity

⁴ The San Gregorio Fault Zone is sometimes referred to as the San Gregorio-Hosgri Fault Zone to include the system of northwest trending faults that parallel the coast from Lopez Point near Lucia to Point Sal near San Luis Obispo.

during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. Ground shaking can be described in terms of peak acceleration, peak velocity, and displacement of the ground.⁵ Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill or natural alluvium. The composition of underlying soils in areas located relatively distant from faults can intensify ground shaking. Portions of the Bay Area that experienced the worst structural damage due to the Loma Prieta earthquake were not those closest to the fault, but rather those with soils that magnified the effects of ground shaking.

The close proximity of the San Andreas and Zayante faults could result in ground shaking at the project site during a seismic event, similar to that experienced during the 1989 Loma Prieta earthquake. However, in the event of an earthquake on a remote segment of the San Andreas or Zayante faults, or on the more distant San Gregorio Fault, underlying stratigraphy would more strongly effect potential ground shaking levels.

Soils

The soil types within The Forest of Nisene Marks State Park vary widely depending on location, slope and the ability of underlying bedrock to weather and form soil horizons. The Natural Resources Conservation Service (NRCS) Soil Survey has mapped approximately 36 different soil types within the Park; the primary soil types found in the Park are depicted on Figure 4.

The most common soils in the Park are the Lompico-Felton Complex, the Nisene Aptos Complex, and the Ben Lomond sandy loam. The Lompico-Felton Complex (depicted on Figure 4 as peach colored) is located throughout the northeast portion of the Park. This soil is composed of loams and sandy loams located on steep slopes that have derived from sandstones, siltstone and mudstone. A soil that commonly forms on the Purisima Formation bedrock is the Nisene-Aptos Complex, (olive-green colored in Figure 4) a deep and well-drained sandy loam. Depicted in Figure 4 as blue colored, the Ben Lomond sandy loam is a deep well drained soil derived from sandstone. These soils all experience rapid runoff and are highly susceptible to erosion, characteristics that can contribute to slope instability and landslides.

Landslides

Landslide activity within the Park has occurred in areas with steep canyon slopes and weakly cemented sandstone and siltstone bedrock. These areas, when saturated or undermined, can be susceptible to slope instability. In addition, seismic activity and ground shaking can result in large and small-scale slope failure.

⁵ Peak acceleration, peak velocity, and peak displacement values were measured by strong-motion detectors during the Loma Prieta earthquake in several ground and structure strong-motion stations in the Bay Area. For comparison purposes, the maximum peak acceleration value recorded was in the vicinity of the epicenter, near Santa Cruz, at 0.64 g. The highest value measured on the San Francisco Peninsula was 0.33 g, recorded in artificial fill soils at the San Francisco International Airport (CDMG, 1990). Peak Ground Acceleration is the maximum horizontal ground movement expressed as acceleration due to gravity or approximately 980 centimeters per second.

Although numerous landslides have historically occurred in the Park, the landslide triggered by the 1906 earthquake near Hinckley Creek which buried the Loma Prieta Lumber Mill and killed nine people is the most infamous. This seismic event also resulted in widespread slope failure within the Aptos and Bridge Creek drainages as well. Recent mapping efforts have detailed these locations (Weber and Associates, 1989), indicating that the most extensive landsliding occurred in areas underlain by the Purisima Formation. This weak, poorly consolidated sandstone and siltstone is highly susceptible to failure when subject to seismic ground shaking. The 1989 earthquake similarly triggered extensive shallow landslides along the steep slopes of Aptos Creek.

Paleontology

Many times during the past geologic ages, Santa Cruz County was partially or completely covered by the sea, with thousands of feet of marine sediments deposited on the ocean floor. Eventually, the sediments hardened into rock and were uplifted to form a portion of the Santa Cruz Mountains. Included in this sand, gravel and mud were animal remains such as shells, teeth and bones, and plant remains such as leaves and wood. Over time the ancient plant and animal remains became fossils – molds and impressions and other traces of past life.

The geologic units that underlie the Park are primarily marine deposits and should be considered as having a moderate paleontological sensitivity with regard to paleontological resources. Fossils are rarely found in overlying marine terrace deposits. Most of those that are found consist of whale vertebrae and fossilized shells identical to species now living (Perry, 1977). Most of the fossils are of various clam species. Remains of land animals are very scarce in Santa Cruz County.

Biotic Resources

Plant Life

Regional Vegetation

The Forest of Nisene Marks State Park lies in the Santa Cruz coastal region. This region has a Mediterranean climate and varied elevation. Past and on-going human activities (e.g., logging, agricultural development, residential development, mining) in the region have altered natural vegetative patterns or otherwise limited large expanses of most natural communities. The results of these processes are evident in the Park.

Vegetation of the Park

The Park is broadly defined by five plant communities⁶: grassland, scrub and chaparral, woodland and forest, riparian, and marsh. Based on the Sawyer and Keeler-Wolf (1995) plant classification system these vegetation types contain ten plant series (i.e., subtypes), Figure 6. Many of these vegetation series intergrade subtly and are difficult to separate for mapping purposes. For example, Douglas-fir tanoak contains stands dominated by madrone, interior

⁶ ESA biologists visited the Park on April 15, June 21, July 17, and 18, 2001 to make preliminary characterizations of vegetative communities. Although surveys were floristic in nature, no attempt was made to identify targeted species of plants.

live oak, and tanbark oak that are too small to map on a coarse scale. It is important, however, to identify plant community subtypes to the finest scale possible, for it is at this level that rare status is applied by agencies. Several of the Park's plant communities are considered rare by the California Department of Fish and Game, including purple needlegrass grassland, northern maritime chaparral, redwood forest, red alder riparian forest, and coastal and valley freshwater marsh.

The following descriptions include approximate area of coverage, habitat requirements, community sensitivities, and a list of characteristic plant species. Descriptions are based on observations of dominant⁷ plant species and their common associates.

Grassland Communities

Three grassland series, covering a total of approximately 5 acres, are located in three widely separated areas within the Park. These grasslands include purple needlegrass grassland, introduced perennial grassland, and California annual grassland.

Purple Needlegrass Grassland Series. Purple needlegrass grassland series occurs on a southwest facing slope with relatively shallow soils in the Mangel's area near the southeast edge of the Park. This approximately 2 ½ acre grassland is overwhelmingly dominated by purple needlegrass (*Nasella pulchra*), a native perennial bunchgrass. The lack of non-native annual grasses, such as wild oats (*Avena* sp.) and rattlesnake grass (*Briza maxima*), in this grassland qualifies it as an important resource, since needlegrass grasslands elsewhere typically contain a higher density of non-natives. Other grassland species observed here include the native harvest brodiaea (*Brodiaea elegans*), *Agoseris* sp., owl's clover (*Orthocarpus* sp.), and blue-eyed grass (*Sisyrinchium bellum*), as well as non-native red clover (*Trifolium angustifolium*) and common plantain (*Plantago major*).

This grassland appears to be of natural origin and is markedly different in character on either side of a fence that bisects it. The area south of the fence was grazed by horses for a number of years before the property was acquired for the Park. The needlegrass grows more densely and is taller here than on the ungrazed north side of the fence, perhaps due to soil enrichment from horse manure.

This formerly more widespread community has been greatly reduced throughout California since the advent of agriculture, grazing, and residential development, and is considered rare by the California Department of Fish and Game's Natural Heritage Division.

Introduced Perennial Grassland Series. Introduced perennial grassland series occurs at Cusack's Meadow in the upper portion of the Park. Cusack's Meadow appears to be a natural meadow with several springs and seeps. Historically, this area was the site of a portable sawmill from the 1920s-1940s. During this period, artificial clearing may have expanded the meadow area. Cusack's Meadow is dominated by velvet grass (*Holcus lanatus*), a non-native perennial species that thrives in moist areas. Other species found here include common rush (*Juncus patens*), blue-eyed grass, common plantain, and long-petaled iris (*Iris longipetala*).

⁷ The term 'dominant' is defined as the overstory species that contributes the most cover or basal area to the community, compared to other overstory species. This definition is based on physiognomy (architecture of canopy layers and life form).

Additional native species occurring in this area include yellow mariposa lily (*Calochortus luteus*), California plantain (*Plantago erecta*) and elegant tarweed (*Madia elegans*). Santa Cruz clover (*Trifolium buckwestiorum*), a California Native Plant Society (CNPS) list 1B species, occurs in Cusack's Meadow (R. Morgan, personal communication, 2001). Santa Cruz tarplant (*Holocarpha macradenia*), listed as federally threatened and State endangered, has also been reported (CNDDDB, 2001) as occurring here but this has not been verified in recent years.

California Annual Grassland Series. California annual grassland series occurs on ridgetops at Lone Tree Prairie in the upper reaches of the Park. Lone Tree Prairie is thought to have originally been cleared during the logging period and is approximately ½ acre in size. Apparently this site would be quickly overrun by coyote brush (*Baccharis pilularis*) if it were not cleared annually by the California Division of Forestry for emergency helicopter use. No native grass species are listed as occurring here, and the dominants include foxtail barley (*Hordeum jubatum*) and wild oat (*Avena* sp.).

Other native species reported as occurring in non-native grasslands include yellow mariposa lily (*Calochortus luteus*), four-spot (*Clarkia purpurea*), common muilla (*Muilla maritima*), California plantain (*Plantago erecta*) and elegant tarweed (*Madia elegans*). Additional non-native species occurring in this community include yellow star thistle (*Centaurea solstitialis*), wild radish (*Raphanus sativus*), and bull thistle (*Cirsium vulgare*).

Scrub and Chaparral Communities

Scrub and chaparral series include coyote brush and woollyleaf manzanita, respectively. These communities cover approximately five percent of the Park's lands. They are found in the drier conditions and rockier substrates that often occur on the highest ridges in the Park, and occur primarily at elevations from 1600 to 2600 feet. Many herbaceous species in these communities are fire-dependent and only germinate after a burn. A number of the shrub species, particularly the manzanitas, are adapted to stump sprouting and can regenerate rapidly after a fire.

Coyote Brush Series. Coyote brush series is dominated by coyote brush (*Baccharis pilularis*) and, although this community has a fairly wide distribution throughout the northern Coast Ranges, it is quite rare in the Park. This community represents an early seral stage, establishing readily in open areas created by disturbance. In the Park, coyote brush series can be moderately open, with grasses and herbaceous species growing in openings, or the shrub canopy can be quite dense. Several acres of this community occur on a ridge in the Buzzard Lagoon area at the eastern edge of the Park. This area has been subjected to repeated disturbance by off-road vehicle use roughly between 1940 and the 1980s and substantial erosion is evident. Shrub associates in the area include lupine (*Lupinus albifrons*), coffeeberry (*Rhamnus californica*), poison oak (*Toxicodendron diversilobum*), and stiffly-branched bird's-beak (*Cordylanthus rigidus*). Herbaceous species observed include elegant tarweed (*Madia elegans*), least trefoil (*Lotus micranthus*) and a variety of primarily non-native grasses, including dogtail (*Cynosurus echinatus*) and wild oats.

Woollyleaf Manzanita Series. Woollyleaf manzanita series occurs along Santa Rosalia ridgeline, its south facing slopes, and several other lower peaks in the Park. These areas are characterized by thin, rocky soils and relatively low available soil moisture. Dense mature

stands of woollyleaf manzanita (*Arctostaphylos tomentosa*) overwhelmingly dominate this community, with associates occurring primarily along roadsides and in small gaps in the shrub canopy. Shrub associates include chaparral pea (*Pickeringia montana*), bush poppy (*Dendromecon rigida*), chamise (*Adenostoma fasciculatum*), California huckleberry (*Vaccinium ovatum*) and several species of ceanothus. Knobcone pine (*Pinus attenuata*), madrone (*Arbutus menziesii*), and canyon live oak (*Quercus chrysolepis*) occur scattered throughout the chaparral. Other species observed include a mix of native and non-native species, such as golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), poison oak (*Toxicodendron diversiloba*), blue wildrye (*Elymus glaucus* ssp. *glaucus*), Western verbena (*Verbena lasiostachys* var. *lasiostachys*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), and yellow star-thistle. Knobcone pine (*Pinus attenuata*), madrone (*Arbutus menziesii*), and canyon live oak occur scattered throughout the chaparral.

Woollyleaf manzanita series is endemic to California, and has a limited distribution within its range. It is, therefore, accorded the highest rarity status possible by the Nature Conservancy Heritage Program. The extent of this plant community appears to have been reduced since vegetation within the Park was mapped in the 1970s. Natural succession has transformed some areas to canyon live oak forest, with only the numerous dead manzanita in the shrub layer and a few small patches of still living woollyleaf manzanita in the canopy gaps proving that this was indeed once chaparral. Young canyon live oaks and other tree species, emergent from the shrub canopy, are evident in the remaining stands of chaparral in the Park.

Woodland and Forest Communities

Woodland and forest plant communities include Douglas-fir – tanoak and redwood forest series. Douglas-fir – tanoak occupies approximately 20 percent of the Park, whereas, redwood forest covers 80 percent of the Park. Most of the redwood forest was clear-cut over a period of 40 years, from the 1880s to the 1920s. Logging began in the Aptos Creek watershed and the area west of Bridge Creek was last to be cut. Additionally, an area along Aptos Creek near the Park entrance was cut again in the 1950s. Reports vary as to how many old-growth redwoods remain in the Park today. There may be as many as 127 old-growth trees or groves along the upper reaches of Hinckley Creek. A relatively new addition to the Park is 30 old-growth clusters in the Mangel's area that were not cut during the logging period and estimated to be over 200 years old. In addition to these two areas, there are old-growth trees within a large grove of white alders just west of Aptos Creek near the Park's southern boundary, and the Mangels-Van Eck Dedication Tree, located along Aptos Creek Road near the Park entrance, measures approximately 12 feet in diameter.

Douglas-fir – tanoak Series. Douglas-fir – tanoak series is generally found on slopes at elevations between redwood forest and chaparral or coastal scrub communities, where conditions are drier than those required by redwood forest and more mesic than those required by chaparral. Douglas-fir – tanoak also occurs in the smaller drainages of ephemeral streams. This forest type intergrades with redwood forest throughout the Park, and most of the Park's tree species can be found in both communities, including tan oak (*Lithocarpus densiflorus*), madrone (*Arbutus menziesii*), interior live oak (*Quercus wislizenii*), canyon live oak (*Quercus chrysolepis*), and Douglas-fir (*Pseudotsuga menziesii*). The mixing of these two forest types may be due to the clear-cutting that occurred from the 1880s to the 1920s. Not only were the redwoods cut during this time, but most of the hardwood species were also cut for firewood and other purposes. The wide-scale clearing of the Park may have provided a competitive

edge to many of the hardwoods, allowing them to establish among the redwoods in greater numbers than in old-growth areas. It is consequently likely that the extent of mixed hardwood forest is greater today than it was prior to logging.

The character of Douglas-fir tanoak is variable according to overstory dominants, slope, aspect, and elevation. There are at least four distinct forest subtypes within this series: madrone forest, canyon live oak forest, interior live oak forest, and tanoak forest. Overstory dominants can change frequently within short distances; thus, it would only be possible to map these forest subtypes on a very fine scale. Madrone and canyon live oak forests occur on the higher slopes of the Park, for example along Santa Rosalia Ridge. Tanoak forest occurs adjacent to redwood forest, and interior live oak forest occurs on the lower slopes of the Park, for example within the drainage of an unnamed tributary to Mangel's Creek. In some areas these forest types are represented by pure stands; however, it is more often the case that one or more of the tree species listed above occur as associates.

In all Douglas-fir - tanoak types the canopy is fairly dense and often continuous, leading to a low diversity and scattered distribution of understory species, except in areas where gaps have opened up in the canopy or along roadsides. Understory is nearly absent in madrone and tanoak forest, where often dense canopies combine with thick layers of leaf litter to inhibit growth of herbaceous species and germination of shrubs. Understory species in other forest subtypes include California blackberry (*Rubus ursinus*), western wood fern (*Dryopteris arguta*), ground rose (*Rosa spithamea*), yerba buena (*Satureja douglasii*), creeping snowberry (*Symphoricarpos mollis*), Douglas iris (*Iris douglasiana*), pink-flowering currant (*Ribes sanguineum* var. *glutinosum*), and California tea (*Rupertia physodes*).

Redwood Series. Redwood series occurs on upland areas and on alluvial streamside terraces. The upland forest type is second-growth redwood (*Sequoia sempervirens*). This plant community occurs along California's central and north coast, often on steep slopes with shallow soils in areas of coastal fog incursion. Upland redwood forest dominates the Park, occurring in most stream canyons and upslope at all elevations, except on the highest ridgetops and some south facing slopes where conditions become too dry. Many of the Park's redwoods grow in clusters formed when the parent tree was logged and subsequently stump-sprouted, but single trees also occur, growing from seedlings that germinated after logging. The age of these trees ranges from 80 to 120 years, and their average height is approximately 125 feet. Other tree species that occur within the upland redwood forest include Douglas fir, tanoak, and madrone, and occasional interior live oaks. In the bottom of headwater stream canyons, big-leaf maple can also be found in association with redwood.

Upland redwood forest understory tends to be sparse. Due to the immaturity of this forest, canopy cover and tree distribution are dense, and leaf litter accumulations are high. In a mature redwood forest, competition between young trees, windthrow, and other natural disturbances result in more widely spaced trees, allowing more light to reach the forest floor. Understory species in the Park occur most profusely in canopy gaps and along roads. Common species include redwood sorrel (*Oxalis oregana*), western sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), California blackberry, California hazelnut (*Corylus cornuta* var. *californica*), huckleberry (*Vaccinium ovatum*), and snowberry (*Symphoricarpos albus* var. *laevigata*).

Riparian Communities

The Park encompasses most of the Aptos Creek watershed and parts of the Hinckley and Mangels Creek watersheds. These are generally small streams, and the steep topography, uplifted by faulting, keeps them confined to narrow canyons for most of their lengths. For the most part, redwood is the dominant overstory species along these headwater canyons and the understory along the stream banks contains characteristic redwood riparian species, including elk sorrel (*Aralia californica*), five-finger fern (*Adiantum pedatum*), and giant chain fern.

Below approximately 350 feet in elevation, the Aptos Creek canyon begins to widen out and the stream's gradient begins to flatten. Although the canyon is still narrow along part of this reach, there are also areas wide enough for floodplains to form.

Redwood Series. Alluvial redwood forest occurs on an old stream terrace along Aptos Creek, south of the Steel Bridge and west of Aptos Creek. The redwoods here, second growth trees over 100 years old, are more widely spaced than is usual for the upland redwood forest, and large tan oaks grow in association with them. A more open canopy, combined with deeper alluvial soils and flat terrain, allows for a more completely developed herbaceous redwood understory than elsewhere in the Park. Redwood sorrel and western sword fern grow in association with slim solomon (*Smilacena stellata*), wild ginger (*Asarum caudatum*), fetid adder's tongue (*Scoliopus bigelovii*), western trillium (*Trillium ovatum*), red clintonia (*Clintonia andrewsiana*), and three species of violets, including evergreen violet (*Viola sempervirens*). The understory in the old-growth redwood/alder community at the Park's southern end includes dense giant chain fern (*Woodwardia fimbriata*) as well as giant horsetails.

Red Alder Series. Red alder series occurs along the narrow floodplains of Aptos Creek mentioned above. The overstory is dominated by red alder (*Alnus rubra*), with big-leaf maple and California bay (*Umbellularia californica*) also occurring. Understory species include western sword fern, giant chain fern, and California blackberry.

Red Willow Series. Red willow series occurs on stream terraces along the lower reaches of streams in the Park, where the overstory canopy is open. Areas where this community was observed include along an unnamed tributary to Mangel's Creek and along Aptos Creek, downstream from the red alder series. Species in this community include red willow (*Salix laevigata*), blue elderberry (*Sambucus mexicana*), coffeeberry (*Rhamnus californica*), California blackberry, coyote brush, sneezeweed (*Helenium puberulum*), and mugwort (*Artemisia californica*).

Wetland and Marsh Communities

Wetlands⁸ and aquatic habitats within the Park include portions of stream channels, riparian communities (red alder riparian forest, and riparian willow scrub), sag ponds (open water and coastal and valley freshwater marsh), and freshwater seeps.

⁸ Although there are several definitions for the term *wetland*, the one used herein follows the U.S. Army Corps of Engineers (COE) convention. Wetlands are defined under the Clean Water Act as, "Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[b]). The COE uses the three wetland parameters to define wetlands: hydrophytic vegetation, hydric soil, and

Cattail Series can be found in several areas of the Park, notably White's Lagoon and Buzzard Lagoon. There are also several other ponds that fill with water during wet seasons. In the upper reaches of the Park, proximity to tectonic activity along the San Andreas Fault creates sag ponds and numerous seeps. Fracturing and shearing of the underlying rocks allows ground water to seep to the surface, and in some cases, to pond there, creating freshwater marsh, wet meadow, and seep communities. White's Lagoon, for example, is home to plants and wildlife found nowhere else in the Park. This cattail series is wet year around, with water depths ranging from one to two feet. Emergent vegetation includes cattail (*Typha latifolia*), common tule (*Scirpus acutus*), sickle-leaved rush (*Juncus falcatus*), and water smartweed (*Polygonum punctatum*). A variety of willows grow along the borders of the marsh, including Coulter's willow (*Salix coulteri*) and Scouler's willow (*Salix scouleri*).

Freshwater Seep. Freshwater seeps occur throughout the Park but are most pronounced in Cusack's meadow. Dominant species observed in seeps in the Park include sedges (*Carex* spp.), California buttercup (*Ranunculus californicus*), perennial rye-grass (*Lolium perenne*), toad rush (*Juncus bufonius*), common rush (*Juncus patens*), long-petaled iris (*Iris longipetala*), yellow mariposa lily (*Calochortus luteus*), and California plantain (*Plantago erecta*). Freshwater seeps are distributed through most regions of California. This community type has been severely restricted in acreage and habitat quality due to water diversion and urban and agricultural land conversions.

Exotic Species

Exotic plant species are non-native species capable of establishing viable populations in the wild. These species are often adapted to a Mediterranean climate, and are highly competitive since they tend to be annuals that produce prolific amounts of seed. They invade native plant communities, rapidly colonizing both disturbed and undisturbed sites, and compete for resources with native species. Invasive species decrease diversity by forming monocultures and by displacing native plant and wildlife species.

A number of invasive species occur in the Park that were first introduced during the logging era of the 1880s-1920s. Logging workers planted species such as eucalyptus, black acacia, periwinkle and English ivy. The incidence and diversity of exotic species is greatest in the lower areas of the Park, adjacent urban and rural land uses, and in areas of the upper Park that were used historically for purposes other than logging. Exotic species occur along nearly every road and many of the trails.

The California Exotic Pest Plant Council (CalEPPC) has compiled lists of invasive wildland plant species to aid in tracking the spread of, and in managing such plants. These lists can be useful to land managers for exotic management prioritization. Exotic pest plants considered most invasive by CalEPPC and that have been observed in the Park are presented in Table 3.

wetland hydrology. Although many unvegetated sites (e.g., mudflats, stream shallows, saline lakeshores, playas, deepwater) or sites lacking soil (e.g., rocky shores, gravel beaches) may not be classified as wetland habitats, the COE regulates these areas under Section 404 of the Clean Water Act as "other waters of the United States."

Animal Life

Regional Animal Life

The proximity of the coastal mountains has isolated the Santa Cruz County shore, and resulted in a high degree of endemism (i.e., species restricted to this area alone). The phenomenon has been noted by natural scientists for some time: one of the earliest animals to receive endangered species status was the highly localized Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*), listed under the precursor to the Endangered Species Act in 1967. Residential and agricultural development in the region has reduced open space, limiting large expanses of most natural communities. Smaller species such as reptiles, amphibians and invertebrates are often restricted to certain communities, but regional open space, with its diversity of communities, is an important consideration for animals whose home ranges encompass several habitats.

Animal Life of the Park

The Park includes a number of wildlife habitats within its boundaries, although the largest part of the Park is redwood forest. Large stands of redwood forest are typically low in species abundance, but the number of species present generally increases where redwood forest is associated with other habitat types (Cooperrider et al., 2000). Thus the overall wildlife value of the Park is due not only to the variety of habitats within it, but to their interspersed, which benefits varied species including bats, deer, and a number of birds. However, redwood forest itself has its substantial wildlife value, especially when it is not fragmented. The Park contains a large, unfragmented expanse of second-growth redwood, along with small areas of third-growth and some uncut, old growth trees. This second-growth forest is old enough to provide many habitat characteristics normally associated with redwood forest, and its relict, uncut stands may improve its current value as habitat for some species normally associated with older redwood forest.

Woodland and Forest Habitats

Redwood Forest Habitat. Redwood and other forests in the Park are notable as wildlife habitat because of its extent, its lack of fragmentation, and its geographic relationship with other habitats. Redwood forest extends to the boundaries of the Park on all sides, and it largely forms a contiguous forest within those boundaries.

The interior of the Park's redwood forest is broken only by the riparian areas of Aptos and Bridge creeks; two fire roads (the Aptos Creek Fire Road and the fire road from Sand Point Overlook to the west entrance near Hinckley Creek); scattered, small areas of other habitat types, primarily chaparral and mixed evergreen forest; and a number of trails. The riparian areas and their associated streams have distinct habitat values (discussed below), and the association of these areas with forest is advantageous for some species: bats, for example, roost in hollow forest trees, sometimes in the basal hollows of old-growth redwoods, but forage over the open water (Cooperrider et al., 2000).

No vertebrates are strictly endemic to redwood forest, which is generally characterized as having low animal species diversity, particularly in older forests (Cooperrider et al., 2000).

Animals typical of redwood forest habitat within the Park include birds such as Steller's jays (*Cyanocitta stelleri*) and varied thrushes (*Ixoreus naevius*); mammals, especially bats, which use snags and tree cavities, but also woodrats (*Neotoma* spp.) and mule deer (*Odocoileus hemionus*); and invertebrates such as the banana slug (*Ariolimax columbianus*). Redwood forest amphibians include a variety of salamanders, including the California slender salamander (*Batrachoseps attenuatus*), which inhabit wetter areas of the forest floor, particularly where they can shelter under woody debris. However, the number of reptile species is typically low in redwood forests, probably because of the lack of areas where they can thermoregulate by basking in the sunshine (Cooperrider et al., 2000). In addition to its present value as unfragmented habitat, redwood forest in the Park has a future value as mature forest, potentially providing habitat for animal species largely associated with more mature forests than presently exist in the Park. These include marbled murrelets (*Branchyramphus marmoratus*).

Habitat interspersation on the perimeter of the Park's redwood forest occurs largely on the northeast boundary, along border of the Soquel Demonstration State Forest and eastward through the Buzzard's Lagoon area. The forest border in this area is largely Douglas-fir tanoak chaparral. These areas provide better forage for deer than the forest interior, and deer are likely to move between the interior and habitats on the forest edge. Two species of potential management concern might also use these areas of habitat interspersation: cougar (*Felis concolor*), because they prey largely on deer, and black bear (*Ursus americanus*), which are largely forest dwellers, but may use a variety of habitats at different seasons.

Although the Park is not within the range of the black bear as noted by Ingles (1965) and Burt and Grossenheider (1976), its range is expanding, and recent news reports have noted its presence in Carmel and near the San Francisco Watershed, south of San Francisco. The Park thus lies between two areas where black bears have recently been observed. The mix of habitats in the Park appears suitable for black bears, which although largely forest dwellers are found in a variety of other habitats (Forsyth, 1999).

Montane Hardwood-Conifer Habitat. Montane Hardwood-Conifer Habitat is found largely on the Park's northeast perimeter, extending from the boundary with the Soquel Demonstration State Forest on the northeastward along the Santa Rosalia Ridge and through the Buzzard's Lagoon area. This habitat type is found in drier areas than redwood forest, and its characteristic wildlife species reflect this fact. Scrub jays (*Aphelocoma coerulescens*) are more frequently seen than Steller's jays, and band-tailed pigeons (*Columba fasciata*) were frequently noted during our site visit, along with spotted towhees (*Pipilo maculatus*) and chestnut-backed chickadees (*Parus rufescens*). Western gray squirrels (*Sciurus griseus*) were often seen, as were the tracks of mule (black-tailed) deer (*Odocoileus hemionus*) and coyote (*Canis latrans*) scat. Areas dug up by wild pigs (*Sus scrofa*) were also numerous; the numerous acorns on the ground presumably provide food for both deer and pigs.

Riparian and Stream Habitats

Riparian and stream areas are found largely along Aptos Creek and its tributary, Bridge Creek. The increased moisture and sunlight in these areas supports a greater variety of vegetation than found in the redwood forest itself, and the number of animal species likely to be present also rises. Raccoons (*Procyon lotor*) are likely residents of riparian areas, and

dusky-footed woodrats (*Neotoma fuscipes*) are often found in streamside thickets as well as in the forest interior.

Bird species commonly found in redwood forest riparian areas of the Park include the American dipper (*Cinclus mexicanus*), found on clear, fast-flowing streams (CDFG, 1999), and the fish-eating belted kingfisher (*Ceryle alcyon*), which nest in banks near the water (Ehrlich, Dobkin, and Wheye, 1988). Northern saw-whet owls (*Aegolius acadicus*) are often found in riparian areas associated with coniferous forests (Johnsgaard, 1998) and have been reported as occurring within the Park (D. Miller pers. comm., 2001).

Riparian portions of the Park are particularly important for amphibians, which must lay their eggs in water. The Pacific giant salamander (*Dicamptodon ensatus*) and the foothill yellow-legged frog (*Rana boylei*), a State Species of Special Concern (refer to Special Status Species, below), and are both known from the Park's riparian areas (CDFG, 1997a, 1997b). Foothill yellow-legged frogs prefer slower moving water and frequently sun on rocks and gravel bars. Pacific giant salamanders lay their eggs under large streambed substrates, primarily in riffles, while the yellow-legged frogs attach their eggs to rocky substrates in shallow-slow moving water near stream margins (Welsh, H.H., T.D. Roelofs, and C.A. Frissel, 2000).

While many amphibians reside in cool, moist environments, many reptiles require warmer temperatures and even direct sunlight to establish adequate body temperatures (Cooperrider et al., 2000). The western pond turtle (*Clemmys marmorata*) is the only turtle of redwood forest ponds, lakes, streams and rivers, and may occur in stream or pond habitats of the Park. Refer to Aquatic Life, below for discussion of Park fisheries.

Scrub and Chaparral Habitats

Chaparral areas are interspersed with Douglas-fir tanoak forest along the Aptos Creek fire road in the northeast portion of the Park, and are found elsewhere, including Hinckley Ridge. Many wildlife species are common to both, but during our site visit chipmunks (presumably Merriam's chipmunks, *Eutamias merriami*), western fence lizards (*Sceloporus occidentalis*), and California quail (*Callipepla californica*) were also in the chaparral areas. Coyote and bobcat (*Lynx rufus*) are also likely to be found as transitory visitors to chaparral portions of the Park, and deer tracks were fairly numerous.

Grassland Habitats

Grassland habitat occupies only a small area in the northern portion of the Park, including Cusack's Meadow and Lone Tree Prairie, as well as a part of the Mangels Ranch area at the Park's southern end. Grasslands support their own suite of wildlife, including a prey species such as seed-eating rodents, which attract mammalian predators, including coyotes and gray fox (*Urocyon cinereoargenteus*), which are also found in chaparral. Grasslands also provide open areas where raptors such as the red-tailed hawk can forage. At the time of our site visit, areas where wild pigs had been rooting were noticeable in the grasslands by Hawk Point, in the Mangels Ranch area of the Park.

Freshwater Marsh Habitat

Freshwater marsh is found at White's Lagoon and various sag ponds and seeps found in the upper Park, along the San Andreas fault zone. These marshes likely support amphibian populations, including California newts (*Taricha torosa*) and Pacific tree frogs (*Hyla regilla*). These areas may also provide habitat for the California red-legged frog (*Rana aurora draytonii*). Larger mammals such as bobcat may occasionally use wetland features within the Park.

Exotic Wildlife – Wild Pigs

Wild pigs in California are apparently descended from Eurasian wild boar, released for sport hunting in the last century, and free-ranging pigs introduced by the Spanish. Forty-nine of 58 California counties now have wild pig populations, up from 10 in the 1960s (Waithman et al., 1999).

Although studies of pig diets in California show them to be primarily herbivorous (Schauss, 1980; Baber, 1985), pigs are true omnivores. Moreover, although habitat use may show preferences for oak woodlands (acorns are a major food source) and cool canyon bottoms in summer (pigs have no sweat glands) they can move widely and essentially appear anywhere within a very extensive home range. They forage by “rooting” – probing underground with their snouts for roots, bulbs and invertebrates. Sediment yields from rooted plots can be two or three times as high as ambient erosion, and non-native species plant species increase in rooted areas (Leonard Charles Associates, 1987). At least hypothetically, wild pigs can compete with native wildlife for food and can be reservoirs of disease (Waithman et al., 1999). Wild pigs are difficult and expensive to eradicate. Areas of current rooting include Park grasslands, in the southern portion of the Park, and in the mixed evergreen/oak areas along Santa Rosalia Ridge, where acorns were numerous.

Wildlife Movement Corridors

Wildlife movement between the Park and adjacent undeveloped lands to the north are unconstrained. Highway 1 and residential development along the property's southern, eastern and western borders would likely channel larger wildlife movement to more central portions of the Park.

Aquatic Life of the Park

Two legally sensitive species of anadromous⁹ fish are known to have existed in the Park: the steelhead (*Oncorhynchus mykiss*) and the Coho salmon (*Oncorhynchus kisutch*). Both lay their eggs over gravel and cobble of various sizes (see species accounts, below). Trout fingerlings were noted in Hinckley Creek, near the Park boundary, but their species was not determined.

⁹ Fish that breed in freshwater but spend a large part of their lives at sea.

In 1997, volunteers for the California Department of Fish and Game produced biological inventories¹⁰ for both Aptos and Bridge Creeks (CDFG, 1997a, 1997b). The results showed that Bridge Creek had significantly higher percentage of sites with high habitat quality than Aptos Creek (Table 4). This may be due to the fact that much of the sampling in Aptos Creek was downstream of the confluence with Bridge Creek (CDFG, 1997a), so that the portion sampled received silt both from Bridge Creek and the higher elevations of Aptos Creek itself. Percentages of sampling locations with different spawning-site values in Aptos and Bridge Creeks are presented in Table 4. Spawning-site value is based on embeddedness; a value of 1 is the highest quality for spawning. The difference in categories is statistically significant (chi-square test, $P < 0.001$).

Special-Status Species

Several species known to occur on or in the vicinity of the Park are accorded "special status" designation because of their recognized rarity or vulnerability to various causes of habitat loss or population decline. Some of these receive specific protection defined in federal or state endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of the CDFG or organizations with acknowledged expertise, such as the California Native Plant Society. These species are referred to collectively as "special status species" herein, following a convention that has developed in practice, but has no official sanction.

Appendix B presents information on federally listed threatened or endangered species; species of concern (former federal category 2 species); state-listed threatened, endangered, and rare species; and species that are locally rare or threatened that are known to be or could be present within the Park based on data gathered from the Department of Parks and Recreation, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, California Native Plant Society, and California Natural Diversity Database (CNDDDB). A total of 60 special-status wildlife species and 30 special-status plant species (90 total) have been considered in the evaluation of this plan. Table 5 includes summary data for species considered to have a moderate or high potential to occur within the Park.

Survey Methodologies

Surveys specific to this planning effort to identify individuals or populations of special status species within the Park have not been performed. Data presented herein are based on field reconnaissance, literature review, the professional knowledge and judgment of Park staff, records of observations, published references, and studies of selected species.

¹⁰ Sampling sites were in pool tail-out reaches along stream sections that were most likely to hold Coho salmon (pool habitat with instream woody material and a gradient less than 3%). Embeddedness estimates were made at each site. Embeddedness values of 0-25% were assigned a spawning-site value of 1, 26-50% a value of 2, 51-75% a value of 3, and 76-100% a value of 4. A rating of 1 indicated a high-quality spawning site (based on the value of the site to Coho salmon and assuming the presence of suitable substrate), and higher values indicated lowered quality. An additional value of 5 indicated a pool-tail site unsuitable for spawning because of their substrate particle size. Since the sampling for these inventories included the same habitat along both creeks, the results can be used to compare siltation levels. Embeddedness is a direct measure of habitat quality for both fish and amphibians that spawn in the stream, since unsilted laying substrate is necessary for successful egg hatching.

Invertebrates

Smith's blue butterfly (*Euphilotes enoptes smithi*), listed as endangered by the federal government, occurs from Monterey Bay south through Big Sur to near Point Gorda, at scattered populations in association with coastal dune, coastal scrub, chaparral, and grassland habitats. The Park provides only limited habitat for this species.

Fish

Coho Salmon (*Onchorhynchus kisutch*) may historically have been present as far south as Big Sur, but currently the southernmost naturally spawning populations are in Scott and Waddell Creeks in San Mateo County (Welsh, H.H., T.D. Roelofs, and C.A. Frissel, 2000). Coho salmon have been observed in Aptos Creek, but it is not known if they currently form a self-sustaining breeding population.

Steelhead (*Onchorhynchus mykiss irideus*) are present in both Aptos and Bridge Creeks (CDFG, 1997a, 1997b).

Amphibians

Santa Cruz long-toed salamander (*Ambystoma macrodactylum*) occur in a few areas in Santa Cruz County south of the City of Santa Cruz. Ponds within the Park provide suitable habitat and are in close proximity to the northern Santa Cruz metapopulation for this species.

California red-legged frogs (*Rana aurora draytonii*) can be found in a variety of habitats, with the largest frog populations being found in areas where there are perennial, deep (>0.7 m) water pools bordered by dense, shrubby riparian vegetation. "Critical habitat" for the red-legged frog was proposed in September 2000 and made final in 2001. The Park is within Critical Habitat Unit 17 (USFWS, 2001). Within the Park, the red-legged frog is reported to be "common along streams, marshy areas, and ponds" (Thomson, 1995).

California Tiger salamanders (*Ambystoma tigrinum californiense*) inhabit pool and grassland habitats and are occasionally found along stream courses. White's Lagoon, Buzzard Lagoons, and Hinckley Basin provide suitable habitat for this species.

Foothill yellow-legged frogs (*Rana boylei*) inhabit rocky streams in a variety of habitats (CDFG, 1999); cobble sized substrate is suitable for egg laying (CDFG, 2001). These frogs probably spend most of their time in or near streams, and are rarely encountered far from permanent water, even during the rainy season (CDFG, 1999). They prefer the more open, downstream areas of large creeks and rivers, where they sun themselves on rocks and gravel bars (Welsh, H.H., T.D. Roelofs, and C.A. Frissel, 2000). Foothill yellow-legged frogs have been observed in Aptos and Bridge Creeks (CDFG, 1997a, 1997b).

Reptiles

Western pond turtles (*Clemmys marmorata*) are freshwater turtles, found in permanent or nearly permanent water along lakes, ponds, and streams, and associated with secure basking sites such as logs and rocks surrounded by water, as well as undercut banks that provide refuge from predators such as raccoons (Welsh, H.H., T.D. Roelofs, and C.A. Frissel, 2000);

California Department of Fish and Game, 1999). Upland forest habitats are used both for nesting and for overwintering (Welsh, H.H., T.D. Roelofs, and C.A. Frissel, 2000). Suitable habitat for the western pond turtle is available in the Park's creeks and lagoons.

California horned lizard (*Phrynosoma coronatum frontale*) frequents a variety of habitats, such as scrubland, grassland, coniferous forests, and broadleaf woodland. This species is common in lowlands along sandy washes where scattered shrubs provide cover. Locales should have sunning areas, fine loose soil, and ants and insects. Potential habitat is limited for this species on-site.

Birds

Cooper's hawks (*Accipiter cooperii*) breed in deciduous, mixed, and evergreen forests. The forest area is usually extensive, but occasionally single trees are used. Nests are placed in the main crotch of the tree or on a limb against the tree trunk; nest heights generally range from 25-50 feet (Rosenfield and Bielefeldt, 1993). Some studies have found a preference for nest sites near openings or forest edges, but others have not. Similarly, the relationship between nest sites and available water is not clear (Palmer, 1988). The most usual hunting method is a rapid flight from a concealed perch. Prey are mostly birds, caught in flight, but a substantial portion of mammals such as tree squirrels are also killed (Rosenfield and Bielefeldt, 1993). The Park is within the breeding range of Cooper's hawks as well as the wintering range of migratory individuals. Cooper's hawks are listed as breeding in Santa Cruz County and may occasionally nest within the Park (Santa Cruz Bird Club, 2000).

Sharp-shinned hawk (*Accipiter striatus*). Although their breeding range is generally to the north (Bildstein and Meyer, 2000), sharp-shinned hawks are listed as breeding in Santa Cruz County (Santa Cruz Bird Club, 2000). Nesting habitat includes most forest types, although conifers are most often used (Bildstein and Meyer, 2000). Sharp-shinned hawks nest in both the forest canopy and understory, as well as forest edges and other areas; they may hunt either from a perch or starting from low-level flight (Bildstein and Meyer, 2000). The interspersed of various habitat types in the Park provide both nesting and foraging habitat for this species.

Long-eared owls (*Asio otus*) breed largely in coniferous and mixed coniferous-deciduous forest. Areas near water and riparian habitats are often preferred. Nests are in areas of closed canopy, usually in the abandoned nests of other birds or of squirrels (Ehrlich, P.R., D.S. Dobkin, and D. Wheye, 1988; California Department of Fish and Game, 1999). The variety of habitats in the Park, and the large area of closed canopy cover, provide suitable habitat for long-eared owls. These owls are reported as nesting in Santa Cruz County, but they are considered "rare" and their status is not well known (Santa Cruz Bird Club, 2000).

Vaux's swifts (*Chaetura vauxi*) nest in coniferous forests, particularly in redwood and Douglas fir forests. Nests are placed on the inner wall of large, hollow trees or snags (CDFG, 1999). The Park is within the nesting range of this migratory bird (CDFG, 1999) and may provide suitable habitat for this species.

Other raptors and songbirds known to use the Park on a permanent or occasional basis include red-tailed (*Buteo jamaicensis*) and red-shouldered (*Buteo lineatus*) hawks, and turkey vultures (*Cathartes aura*), all of which were noted during field visits to the Park. Owls known to be present include great horned owls (*Bubo virginianus*), barn owls (*Tyto alba*),

western screech owls (*Otus kennicottii*), northern saw-whet owls (*Aegolius acadicus*), and northern pygmy owls (*Glaucidium gloma*). Other species of raptors or songbirds that may nest or occasionally visit the Park include:

- Ferruginous hawk
- Golden eagle
- Costa's hummingbird
- Lawrence's goldfinch
- Lark sparrow
- Olive sided flycatcher
- Black swift
- Hermit warbler
- California warbler
- White-tailed kite
- Pacific slope flycatcher
- Bell's sage sparrow
- Loggerhead shrike
- Lewis' woodpecker
- Long-billed curlew
- Osprey
- Rufous hummingbird
- Allen's hummingbird
- Red-breasted sapsucker
- California thrasher
- Red-tailed hawk
- American kestrel

Mammals

Cougar (*Felis concolor*) numbers are apparently increasing throughout the State. Cougars may currently use the Park occasionally, since the Park is within their range as noted by Ingles (1965) and by Burt and Grossenheider (1976). Cougars are found in both coniferous forests and chaparral-covered foothills (Ingles, 1965), but home ranges shift both seasonally and with the availability of food (Forsyth, 1999). Since cougars primarily eat deer and other large ungulates (Forsyth, 1999, Ingles, 1965), deer movements and abundance would presumably influence cougar use of the Park. Consequently, if located within the Park, cougars might most likely be found away from the central areas of redwood forest, which are not heavily used by deer, and nearer the chaparral and other areas, especially at the habitat edges. Proposition 117, passed in 1990, classified the cougar as a "specially protected mammal" under California Fish and Game Code section 4800.

Bats feed on small insects over water sources and roost in buildings, mines, caves or crevices. The oak woodland and forest community onsite provide suitable habitat for one or several of the bat species listed below. One or more of the following bat species is presumed present within the Park.

- Pallid bat
- Pacific western (Townsend's) big-eared bat
- Western mastiff bat
- Long-eared myotis bat
- Small-footed myotis bat
- Fringed myotis bat
- Long-legged myotis bat
- Yuma myotis bat

Plants

Special status plant species observed in the Park, and those with a moderate or high potential to occur within the Park are described below. General descriptions of suitable habitat and the rationale for determining potential occurrence for the remaining special status species are provided in Table 5.

Coyote ceanothus (*Ceanothus ferrisiae*) is an evergreen shrub in the buckthorn family (Rhamnaceae), and grows from three to six feet tall with a stiff, erect branching habit. Its dark green, round leaves are hairless on the upper surface and a lighter green with tiny hairs below. The plant's small white flowers, borne in clusters from one-half to one inch long, can be found anytime from January to March, depending on climatic conditions. Seed capsules have three conspicuous apical horns. While this species is reported as occurring in the Park by DPR (1974) and CNDDB (2001), the specific location is unknown.

Monterey spineflower (*Chorizanthe pungens* var. *pungens*), a dicot in the family Polygonaceae, is an annual herb that is native to California and is endemic (limited) to California alone. It is listed by the Federal government as Threatened (listed February 4, 1994). Although suitable habitat for this species occurs within the Park, it is above the normal elevational limits for this species. Designated Critical Habitat as proposed by USFWS is located more than 4 miles southeast of the Park.

Santa Cruz tarplant (*Holocarpha macradenia*), a dicot in the family Asteraceae, is an annual herb that is native to California and is endemic to California alone. It is listed by the State of California as Endangered (listed September 1979) and by the Federal government as Threatened (listed March 20, 2000). This species occurs in coastal prairie and grassland habitats with clayey soils. The Park provides only limited habitat.

San Francisco popcornflower (*Plagiobothrys diffusus*) is currently known from fewer than ten occurrences throughout its range.¹¹ Habitat includes coastal prairie and grassland habitats and is often associated with thin soils or rock outcrops. The Park provides only limited habitat.

Santa Cruz Manzanita (*Arctostaphylos andersonii*) is a woody shrub in the heather family (Ericaceae) that occurs in chaparral and coniferous forests and is often associated with redwoods. This manzanita has no burl and is thus unable to stump sprout, but reproduces by seed alone. Its twigs and branches have short, white, gland-tipped bristles and the leaves overlap, with a clasping petiole. Santa Cruz manzanita has an open inflorescence of white to pinkish flowers and blooms from November to April. Although this species has been reported from the Park (CNDDB, 2001), specific locations are unknown.

Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*) is a non-burl forming manzanita that has a generally mound-like form and grows to three to six feet tall. It has spheric white flowers born in an open inflorescence and blooms from February to June. This manzanita can be found in sandy soils in a variety of habitats, including chaparral, cismontane woodland, and closed-cone coniferous forest.

Bristly sedge (*Carex comosa*) is found in moist situations in coastal prairie and valley and foothill grassland, as well as the margins of freshwater marshes. This sedge grows from short rhizomes and its lower spikelets are borne on long, nodding stalks. It blooms from May to September. Although CNPS reports this sedge as extirpated from Santa Cruz County, this species has been reported as occurring in White's Lagoon.

¹¹ The CNPS states that San Francisco popcornflower is known from six occurrences. This record does not take into account the Graham Hill Showgrounds population or the small population located on the Bombay Property in 1995.

Santa Cruz Mountains beardtongue (*Penstemon rattanii* var. *kleei*) is an herbaceous perennial endemic to the Santa Cruz Mountains. It is usually found growing in somewhat sandy soils, often in the transition from forest to chaparral. This species blooms from April to June, with the peak bloom from May to June. Its glandular inflorescence carries two-lipped flowers that are blue-violet without and whitish within.

Santa Cruz clover (*Trifolium buckwestiorum*) is an annual herbaceous species in the pea family (Fabaceae). It frequents edge habitat and can be found in coastal prairie and on the margins of broadleaved upland forests. This pale pink to white flowered clover blooms from April to October.

Cultural Resources

Prehistoric Resources

Regional Prehistoric Background

The Park is situated within a coastal region that was occupied by Native American populations since at least 8,000 years ago. There are five major prehistoric periods known from the Santa Cruz coast. The period between 8500-5500 B.P. has been termed the "Millingstone Period" (cf. Wallace 1955, Warren 1967, 1968). Erlandson (1991, 1994) has suggested that Millingstone Period groups were semi-sedentary, their diets emphasizing shellfish and other marine foods. Other researchers, however, have argued that both coastal and interior habitats were exploited by early Holocene populations targeting a variety of grass seeds, nuts, and other inland plant taxa as well as shellfish (Hildebrandt 1994; Jones and Richman 1995; Mikkelsen et al. 1998).

The next few thousand years (about 5500-3000 B.P.) are referred to as the Early Period. Most notable about prehistoric adaptations at this time are innovations in subsistence technology, marked by the initial use of mortars and pestles and an increase in frequencies of Large Side-notched projectile points.

From about 3000-1000 years B.P. (Middle Period), many of the adaptive trends initiated during the Early Period continued and grew in relative importance. The use of mortars and pestles increased, as did a reliance on small fish, sea otters, and rabbits, but the use of shellfish appears to have steadily declined. Many of the subsistence changes during the Middle Period reflect a growing importance of labor-intensive foods (e.g., acorns, fish); according to Jones (1995:214), this premise is consistent with a "slowly increasing population and a gradually intensifying economy". The appearance of eastern California obsidians (mainly Casa Diablo) in Middle Period assemblages also implies that long-distance exchange relations developed during this period (Jones 1995).

Researchers place the Middle/Late Transition between 1000-700 years B.P. Contracting-stem and Double Side-notched projectile points are typical of this period, as are several types of *Olivella* shell beads and curved shell fishhooks, and hopper mortars and a small leaf-shaped point may have emerged for the first time.

After 700 B.P. populations on the central coast may have rebounded, but their subsistence remains show a continued terrestrial focus. This would be in agreement with accounts of ethnohistoric population levels, which suggest that the Santa Cruz coast had relatively few permanent residents.

Contact Period Background

Although numerous for many parts of California, ethnographic accounts are surprisingly few for the Santa Cruz region. Aside from data accumulated by Kroeber (1907) and Merriam (1968), the greatest body of material is a collection of field notes by Harrington (1921-1938) that remains largely unpublished. Building on several syntheses of “Costanoan” lifeways and geographic distributions (Heizer 1974; King and Hickman 1973; Kroeber 1925; Levy 1978), recent research with mission records by Milliken (1993, 1995) has produced the most thorough examination to date of the ethnographic and protohistoric periods in the region. Beyond the brief summary presented here, we refer the reader to Milliken (1995) for discussions of initial Euroamerican contact and the missionization period in the Santa Cruz area.

The Forest of Nisene Marks State Park lies within a territory once inhabited by speakers of Costanoan languages, a domain which extended from San Francisco Bay along the coast and west-central California to just south of Monterey Bay. The term Costanoan derives from the Spanish word *Costaños* meaning ‘coast people’ (Levy 1978:485).

In the vicinity of the Park, Kroeber (1925) places a native settlement at *Sokel* along lower Soquel Creek and Levy (1978) positions the settlement/tribelet of *aptos* (or *Aptos* [ibid]) along the lower end of Aptos Creek. Milliken (1993) suggests the *Uypi* and *Aptos* groups were separate tribelets, and his reconstruction of tribal boundaries positions the *Sokel* and *Aptos* settlements within Aptos/Cajastaca territory (Milliken 1993: Map 5a, 5b). Furthermore, Milliken (1995:235) indicates the Aptos group “held the shores of Monterey Bay from [the town of] Aptos eastward about half way to the mouth of the Pajaro River.”

Spanish explorers first encountered Native inhabitants of the region in 1602 (Vizcaino) and again between 1769-1776 (Portola, Fages, Riviera, and Anza). During the Mission Period, AD 1770-1835, devastating changes occurred for the Costanoan people. Over the following several decades, the population was recruited into nearby missions and their traditional subsistence economy was replaced by an agricultural economy. Analyses of mission baptismal records demonstrate that the last Costanoan tribelets living a traditional existence had disappeared by 1810 (Levy 1978).

Most size estimates of pre-contact Costanoan populations have been extrapolated from various mission records. Using baptismal records, Heizer (1974) suggested that the pre-contact population of all Costanoans might have totaled 10,000 people, while Kroeber (1925) offers a figure of 7,000.

Contact Period Adaptations

What little is known about contact-period tribal lifeways is unfortunately quite general in detail. Because of its attraction for mission settlement, the San Francisco Bay Area was the focus for most early accounts of Costanoan peoples rather than the Monterey Bay Area.

Narrations tended to emphasize descriptions of coastal economies, and are thus less forthcoming about more inland adaptations. Nonetheless, there are basic similarities between bay and interior groups that can be extrapolated here to provide some insight about Native American subsistence and settlement patterns in the Santa Cruz area.

There are many references in ethnographic literature to the grassland management practices of Costanoan groups (Crespi [1769] 1969; Kroeber 1925; McCarthy 1958 [in Heizer 1974:58]; Menzies [1792] 1924:302; Milliken 1995). Many Costanoan groups were known to routinely burn chaparral vegetation in order to encourage seed growth and to attract game (Blackburn and Anderson 1993; Dillon 1992; Gordon 1987; Hylkema 1991); the burning of upland meadow habitats also may have curbed intrusions of evergreen trees and improved acorn harvests (Lewis 1973).

Records Search Results

An archaeological records search was conducted at the Northwest Information Center for prehistoric sites on the Laurel, Loma Prieta, and Soquel Quadrangles (7.5 Minute Series) within a one-mile radius of the Park. Some 17 archaeological sites are known within this area (Table 6) but none actually impinge on Park boundaries. Several sites do lie just outside the Park, however, and a few have figured prominently in the early history of Santa Cruz County.

Aptos Village Site

One of the most significant sites in the vicinity of The Forest of Nisene Marks State Park is SCr-1, thought by some to be the former location of the last inhabited Native American village in the Santa Cruz region (Cartier 1979). The site was originally recorded by F. Riddell in 1949 as a habitation area with "ca. 18 in. of cultural deposit". Riddell notes the presence of marine mussel and clam shells and describes a lone burial with a variety of associated artifacts (one mortar, two pestles, an antler tool, and steatite ornaments).

Field Survey Investigation

In order to gain insight to prehistoric archaeological sensitivity within the Park, brief judgmental surface inventories at White's Lagoon and Buzzard Lagoon were completed. These areas were determined to have relatively high potential for prehistoric sites given the presence of perennial water and wide varieties of plant and animal resources. White's Lagoon is situated within a primarily Redwood Forest context, and Buzzard Lagoon is set in a Montane Hardwood-Conifer Habitat, these differences providing an important contrast that has some predictive value for prehistoric site locations in the Park.

State of Known Prehistoric Resources in the Park

At present there is only one known prehistoric site within the Park, the newly discovered site near Buzzard Lagoon (NM-1). The actual condition of its subsurface deposit is unknown, but the surface of the site has certainly been adversely impacted by off-road vehicle traffic and by sheetwash erosion.

Unit History

Spanish Era – 1769-1822

From the earliest European contact, the canyons that now comprise The Forest of Nisene Marks State Park resisted entry. The first Spanish land expedition that passed by in October of 1769 was forced to walk on the coastal terrace to the south because the north-south canyons were too difficult to traverse. Even today, the primary east-west transportation arteries follow the route that the Spanish first laid out. Soquel Drive, the Union Pacific Railroad grade, and Highway 1 all crowd together south of the Aptos Canyon's mouth, winding together to cross the southernmost canyon of Aptos Creek. It is difficult enough to cross Aptos Creek on the relatively level coastal terrace beside Monterey Bay. It is impossible to cross the canyons upstream and even today, there is but one road (the Fire Road) and it does not cross the entire canyon.

Over twenty years passed before the Spanish finally put the settlements of Mission Santa Cruz (1791) and the Villa de Branciforte (1797) on the banks of the San Lorenzo River to the west. The primary Spanish access to these settlements was by sea, and the road that followed along the coast and past the mouth of the Aptos Canyon was poor and little traveled. Neither the Franciscan missionaries, nor the civilian residents of Branciforte had any use for the Aptos Canyon, and other than stray livestock that might venture there, the land was virtually unchanged when California passed from Spanish to Mexican hands in 1822.

Mexican Era – 1822-1848 – The Augmentation Line

The Mexican era was a momentous one for the subsequent history of the Aptos Canyon and the Park. Certainly there was some development at the canyon's mouth and cattle and sawyers found their way into the canyon, but the most important change came in the form of a line. The line was only on a map, but it established the template that guides the history of the land to this day. If you look at a map of the Park you will see a straight diagonal slash that angles across the landscape from southeast to northwest, and if you fly over the Park today, there is a major electrical transmission line that follows along that same line. The line marked the boundary between two Mexican land grants, and it is the most important cultural feature in the Park.

Rafael Castro, a native of the Villa de Branciforte and retired soldier in the Mexican Army, was awarded the 6,000+ acre Aptos Rancho in 1833 and built his home on the bluff overlooking Aptos Creek near its mouth. That same year his sister, Martina, was awarded a neighboring grant to the west that she named the Rancho Soquel, and she set up housekeeping on a similar bluff overlooking Soquel Creek. The shared boundary between them was a small gully they named Borregas.

Rafael Castro raised cattle, as did his contemporaries, and the redwood canyons to his north didn't interest him. Cattle don't eat redwood trees. Thus, the northern boundary of the Aptos Rancho was vague and indistinct, reflecting his level of interest in the heavily wooded hills to the north. On his original grant map they were labeled simply "sierra."

In 1840, Martina Castro and her Irish husband Michael Lodge requested that their smallish (1,668 acres) grant be increased—augmented—and they were eventually given a tract of land to the north of the Soquel grant. Over time the boundaries of this Soquel Augmentation grant wrapped around to include the land north of Rafael's, and then from his boundary all the way to the crest of the Santa Cruz Mountains to the north.

Early American Period – 1848-1872

This bucolic scene changed dramatically with the coming of the United States and the admission of the state of California to the Union in 1850. The canyons that heretofore had been of little interest grew increasingly important. And those vague and indistinct lines drawn somewhere off in the rugged sierra became vital. The Americans were a people of contracts, paper, land titles, surveys and money.

In 1850, 45-year old Rafael Castro took his Aptos Rancho title before the Land Claims Commission and eventually received confirmation of its title in 1860. Meanwhile, his sister Martina was having a much more difficult time confirming the titles to her two grants to the north and west. Seven of her eight living children were women, and most had married immigrants during the 1840s and 1850s. Her sons-in-law were an impatient lot, feeling no reluctance in asking for their inheritance while she was still young and relatively healthy. Furthermore, the huge property had become infested with squatters, men convinced that she would never be able to survey the huge parcels of land much less prove clear title. When Deputy United States Surveyor wrote his 1858 summary of trying to survey the outside limits of the Soquel Augmentation grant he said in his introductory notes:

*“The nature of the ground over which the exterior lines of this survey extended rendered the work one of the most arduous character. The mountains are very precipitous, the ravines steep and rugged and the whole covered with chemical or timber and underbrush of the densest character, in many places impenetrable except by great labor in cutting through.”*¹²

Martina's sad tale evolved into one of lawyers, claims and counter claims, with the legal wrangling lasting well beyond her death. What is important for our story is that during the 1850s the boundary line between her Soquel Augmentation and her brothers' Aptos Rancho was surveyed and drawn as the diagonal slash we see today. In the final partition of the Soquel Augmentation first announced in 1858, Martina's daughter Carmel received a 6,000 acre tract of land straddling Aptos Creek immediately to the north of Rafael's.

Meanwhile, even before his title was secured, Rafael he was besieged by offers from energetic Yankees to buy his land. Some of these immigrants were even interested in purchasing some of those previously worthless but now extremely valuable wooded canyons to the north. New England sawyers and loggers saw the economic value of the huge redwood trees growing alongside Aptos Creek, and as the price of redwood lumber was driven ever higher by the thousands of immigrants attracted to the Gold Rush, their value grew ever higher. Castro was reluctant to part with his land, however, so during the period 1850-1872 he negotiated dozens of leases with millwrights, farmers, lumbermen and woodcutters. Rafael

¹² Wallace, John. *Field Notes of Soquel Augmentation Rancho*, handwritten, dated, July 11, 1858.

Castro was a savvy businessman and set up leases that guaranteed he would not only get his land back at their termination, but also the improvements made to it.

To facilitate the shipment of the products at the mouth of Aptos Creek, Castro built a relatively short five hundred-foot wharf in 1850 just west of the creek mouth. During the next three decades lumber, flour, hides, and agriculture products were shipped off this wharf. The landing was known alternately as Castro's Landing or Aptos Landing.

During the 1850s Castro negotiated leases with a series of lumbermen who built water-powered shingle and lumber mills along Aptos Creek in the canyon just north of the east-west county road. The steep gradient and narrow canyon walls provided many spots where the creek could be diverted into a millrace with enough elevation to power a sawmill. Since their equipment was relatively small, the loggers in these early operations cut only the smaller, easily accessible redwood trees.

The Boom in the Mid-1860s

The Aptos Landing wharf was the key to any successful operations on the Aptos Rancho and when Titus Hale rebuilt and extended Castro's original wharf in 1866, it set off a small lumber and firewood boom. Hale and his business partners were interested primarily in the oak trees that dotted the hills behind Castro's house, so they signed a ten year lease allowing them to cut any trees on the entire rancho except fir or redwood. By late 1867 over 4,000 cords of oak firewood were awaiting shipment off the wharf, and San Francisco newspapers claimed that Aptos oak firewood was the best wood available on the San Francisco market. Much of the original oak woodland in and around Aptos went to the hearths of San Franciscans.¹³

The pine and redwood was reserved for Benjamin, Uriah and Merritt Nichols who built a water-powered mill along Aptos Creek in 1866 near the northern boundary of the rancho. They selected a place where the stream passed through a narrow gorge (immediately beneath the present-day steel bridge), and built a system of flumes and millraces that powered saws able to cut 4,000 board feet of lumber a day. They dammed the creek at the narrow spot and used the resulting lake as a millpond. Except for seasonal closures, the mill operated steadily from 1867 to 1878.¹⁴

A small town known as Aptos grew up at the intersection of the always-problematical county road and the road to the wharf at the landing. But, the difficulty of access continued to retard the development of the huge treasure-store that was the upper Aptos Canyon.

The Spreckels Era and the Santa Cruz Railroad – 1872 – 1882

In 1872, beset with old age and marital problems, Rafael Castro sold over 6,600 of his precious Aptos Rancho to sugar magnate, Claus Spreckels, for \$71,000 in gold coin. Spreckels' primary residence was in San Francisco, and he saw his new Aptos property as a summer recreation site as well as a possible location for growing sugar beets. Eventually he

¹³ *Santa Cruz Sentinel*, November 17, 1866.

¹⁴ Devereaux, K. *The History of the Forest of Nisene Marks State Park*, 1983. Unpaginated.

built a summer home for himself and his brother in law as well as a large hotel down on the flat on the east side of Aptos Creek.¹⁵

Spreckels' arrival was coincidental with the efforts then under way to build a railroad between Santa Cruz and Watsonville to connect with the Southern Pacific line that had passed through the Pajaro Valley and on to Salinas in 1872. A railroad connection with San Francisco markets and beyond could provide a great boost to the manufacturing and agricultural interests in Santa Cruz County. Thus it is not surprising to find Claus Spreckels as one of the major shareholders in the Santa Cruz Railroad Road Company that was incorporated in 1873.

The Santa Cruz Rail Road connection between Santa Cruz and Watsonville was completed in 1876, and though it was only a narrow gauge line (36 inches between the rails compared to broad gauge of 56 ½ inches), it helped move Santa Cruz County closer to the industrial age. The little rail line proved to be merely the precursor of the railroad era, however, and it struggled fitfully out of the mid-1870s economic depression only to be met with a major competitor, an over-the-mountain railroad between Santa Cruz and San Jose in 1880, and a major winter storm in 1880-1881.

The Soquel Augmentation – Above the Line – to 1882

While Rafael Castro and Claus Spreckels worked at bringing agriculture and industry to the lower Aptos Canyon, the upper Aptos Canyon remained relatively quiet. A few split stuff operators nibbled at the smaller redwoods in the more accessible reaches of the land, carrying their product westward to the Soquel drainage on horses and mules. But, for the most part, the canyon was filled with potential.

Without the usual upstream mills and tanneries that plagued other local streams, the upper Aptos was a legendary trout fishing stream during the 1860s and 1870s. In 1865, a newspaper account of the fishing on Aptos Creek:

On Thursday last, two well known citizens of Santa Cruz, in company with a gentleman from San Francisco caught eleven dozen fine large speckled trout—some of them a foot in length. One of the party, an expert, took seven dozen, which we think is pretty good fishing and hard to beat...”¹⁶

An 1866 article ranked the county's trout streams listing the San Vicente Creek number one and Aptos Creek number two. It described Aptos Creek as a “*very fine trout stream.*”¹⁷ All of this was about to change.

In 1865, County Surveyor Thomas Wright wrote of Carmel Fallon's Soquel Augmentation tract:

“It is estimated that over two hundred million feet of red wood lumber can be cut off this land, besides, shingles, shakes, staves, fence pickets, posts, railroad ties, etc. Large quantities of tan-bark oak grows in great luxuriance, and no estimate

¹⁵ Collins, A. *Rio Del Mar*, 1995, p. 5 ff.

¹⁶ *Santa Cruz Sentinel*, May 13, 1865.

¹⁷ *Santa Cruz Sentinel*, January 12, 1866.

*can be made of the amount of tan-bark, cord-wood, hoop-poles, etc. to be found on the thousand hills embraced within the tract.”*¹⁸

The Fallon's interests were elsewhere, however, and though Tom Fallon attempted several smaller development schemes along the ocean front bluffs near Soquel, the upper Aptos Canyon remained locked in by technological and financial barriers. The rugged canyon had no easy access, and the huge redwoods were much too large for the small, water-powered mills such as that being operated by the Nichols to the south.

Meanwhile, the Fallon marriage was not going well. There had always been rumors of Thomas Fallon's alcohol-driven abuse of his family, so Carmel's divorce suit in 1876 was no surprise. The suit resulted in a divorce settlement that saw Carmel receive clear title to the 6,845-acre parcel that included the upper Aptos Creek watershed.

By the early 1880s, Carmel Fallon needed some cash, and word circulated throughout Santa Cruz County that the treasure-laden upper Aptos watershed was for sale.

The Southern Pacific Era: Big Lumber Comes to Aptos – 1880-1883

The financial and technological forces necessary to open the treasures of the Aptos Canyon began to coalesce in 1880 with the arrival of the Southern Pacific Railroad on the Monterey Peninsula. During a six-month frenzy the state's most powerful corporation purchased the undeveloped forest lands behind Monterey (today's Del Monte Forest), built the world-class Hotel Del Monte, and laid a broad gauge spur line from Castroville to Monterey. Chinese laborers provided most of the labor in these projects.

In 1881 the corporation quickly snapped up the bankrupt Santa Cruz Rail Road, repaired it and put the narrow gauge back into the operation. The corporation had plans that were larger than the tiny 36 inch gauge track could handle, however, and in 1883, a crew of Chinese railroad workers strengthened the trestles, pulled up the old rail and laid heavier standard gauge tracks.

The economic doldrums of the 1870s had receded in the face of a statewide economic boom lead by Southern California. Soledad marked the southernmost end of the Southern Pacific's coastal railroad route, and beyond it beckoned the huge Los Angeles lumber market. Not to mention the hundreds of thousands of redwood railroad ties that would be required to extend the coastal railroad to Los Angeles. The Southern Pacific needed a new source of redwood lumber close to the Monterey Peninsula and Southern California.

The Watsonville Lumber and Milling Company

Meanwhile, a coalition of Santa Cruz County lumbermen also recognized the growing market for redwood lumber, and in 1881 they formed the Watsonville Lumber and Milling Company. Led by long-time Pajaro Valley farmer and developer John T. Porter, the company's board of directors was a who's who of local financial leaders, including Lucius Sanborn and Charles Ford.

¹⁸ Stanley Stevens, compiler. *F.A.Hihn and his Santa Cruz Rail Road Company*, UCSC, 1997, p. 154.

It is not clear whether the group learned of Carmel Fallon's desire to sell the upper Aptos Canyon and formed the company or vice versa, but in 1881 they negotiated the purchase of the property and began planning how to get the lumber out of the canyon. The purchase price for the 6,500 acres was \$60,000. The group quickly realized that a small mill and horse-drawn wagons would not be sufficient to meet the demand of the southern California market. But they didn't have the necessary capital to bring the technology into the canyon and pry it open.

We don't know exactly who invited the Southern Pacific interests into the Watsonville Lumber and Milling Company meetings, but out of the cigar smoke in 1883 there emerged two entities: the Loma Prieta Lumber Company to cut and mill the lumber, and the Loma Prieta Railroad to build a spur railroad line up into the Aptos Canyon to move the huge logs to the mill and carry the finished lumber down to Aptos. And it was all fueled by Southern Pacific Railroad capital.

The Loma Prieta Lumber Company – Phase #1 1883-1900

Only the Southern Pacific Railroad had the financial and technological muscle to open up the redwood treasure chest in the Aptos Canyon. To say that what they achieved was remarkable is to understate the story. Hundreds of Chinese laborers were brought in and literally overnight they cut and graded the railroad line three miles into the canyon. From that point northward, the grade required bigger cuts, higher fills and more trestles per mile. Eventually, by 1890 the Chinese workers had laid seven and a half miles of standard gauge track and built eleven trestles. This was no delicate narrow gauge operation with tight curves and steep grades; this was an audacious, arrogant, broad-shouldered assault on some of the most convoluted and complicated landscape in all of California. They didn't go around ridges, they went through them; they didn't follow the twists and turns of Aptos Creek, they straightened it out with trestles. And each winter Nature took back what she had so reluctantly surrendered the previous spring. Winter freshets tore out the line and landslides twisted the track so that each spring long sections of the railroad had to be rebuilt. In some places at the upper end of the rail line the railroad grades cut into the canyon walls have completely disappeared, and the only clues remaining of the incredible human effort are twisted pieces of railroad rail in the bottom of the creek. The per-mile cost of building this railroad was estimated to be in excess of \$100,000.

The Town of Loma Prieta

In all the other logging operations in the Santa Cruz Mountains, temporary clusters of makeshift single-wall cabins clustered around the sawmills. These logging camps were common throughout the mountains. The Loma Prieta operation resulted in a bonafide town with store, saloon, school, and church. Babies were born in Loma Prieta, and you could send and receive mail, a telegram, or freight. Since the town was an official destination on the Southern Pacific line, you could purchase a ticket in Chicago that would list Loma Prieta, California, as your final destination. During the summers the town boasted a population of over 300 people living and working in over sixty buildings.

The Loma Prieta Mill

The lumber mill located just downstream from the townsite was the largest 19th century lumber mill in the Santa Cruz Mountains, capable of turning out 70,000 board feet of lumber during a regular twelve hour day, ten times that of its Nichols Brother's predecessor downstream. In the summer of 1888, during a contest with a neighboring sawmill on Valenica Creek the Loma Prieta Mill cut 181,000 board feet of lumber in a 6-½ hour run.

A three hundred foot cribbed log dam was built across Aptos Creek just upstream of the mill and the huge logs were rolled into the pond and maneuvered in position to be drawn into the mill. The cut lumber was stacked on the flat just downstream from the mill, and from there shipped by rail down to Aptos.

A second smaller mill, named Monte Vista, was built one and a half miles above the town site, and it cut logs that were being brought down the steep-sided Aptos Canyon. In 1888 the Monte Vista Mill was moved to its final location seven miles above Aptos in the Aptos Canyon where it operated until all the good timber in the canyon was cut in 1899.

Cutting the Aptos Canyon

The fallers began at the creek bed and then worked their way up the steep-sided canyons, cutting all of the larger, good grade redwood (known as saw logs) and Douglas fir trees. Smaller trees and those with large imperfections were skipped, and today the second-growth redwood forest on the canyon walls is punctuated here and there by gnarled old growth trees that survived the onslaught. The saw logs were peeled, cut into sections, and then maneuvered into ravines and gullies where they were chained together and dragged down to Aptos Creek by teams of oxen. If the mill was close by and downhill, the logs were skidded directly there, but if necessary, they were loaded aboard flatcars and taken to the mill by rail. Gravity was the logger's greatest ally. And much like the water that formed the gullies and ravines that etched the canyon walls, the logs were pulled down the watercourses to the railroad at creek level.

All of this cutting, skidding and hauling had a colossal impact on the land. Side canyon gullies were scraped clear, and the dirt, rocks and other debris rolled into the streams and were then carried down to the main stem of Aptos Creek. Sawdust from the mills was thrown directly into the creek, and in the winter, the thick dust that covered every part of the logging operation washed into the creek. There are no glowing accounts of fishing on Aptos Creek published in the local newspapers after 1883, and in those 1890s accounts that listed the county's premier trout streams, Aptos Creek is never mentioned.

Logger's fires

Fire was a tool used regularly by the loggers. The fallers worked in the woods during the winter months when the mills and ox teams were idled by the mud and bad weather. The logs were peeled, and the bark allowed to dry out sufficiently during early spring so that in April and May the bark, slash, and assorted detritus created by falling and bucking the logs could be cleared from the forest floor by burning. Then, once the clutter was removed, the landscape was clear for the work of dragging the logs down to Aptos Creek. This burning was carried

out in late spring before the surrounding, unlogged forest dried out. The loggers did not intend to set the entire forest ablaze, and rarely did.

Split Stuff and Tanbark

Once the main logging operation was finished in an area, independent contractors who specialized in making split products (pickets, posts, ties) entered the ravines and cut down some of the trees left behind by those cutting saw logs. Tanbark crews also moved into the forest and during the winter and spring, when the moisture content in the tanbark oaks was high and the bark peeled off easily, they cut the trees down and peeled off the bark in four-foot lengths. These rolls of tanbark were then hauled out by mules and sold to local tanneries. Also, other specialists like hoop pole contractors entered the woods and cut the long, slender, pliable hazelnut trees and sold them to coopers who used them to make barrel hoops.

The depression of the mid-1890s slowed the Loma Prieta's lumber operation in the Aptos Canyon, but it was the winter of 1898-1899 that finally brought this huge logging operation to a close. There was not enough standing timber to justify rebuilding the mill, and the company removed the mill at Monte Vista and moved the Loma Prieta Mill around and rebuilt it in the lower part of their property in Hinckley Basin.

Hinckley Basin

The Hinckley Basin is treated separately because it is part of the Soquel Creek watershed and has a different historical focus than its Aptos counterpart. Prior to the advent of logging in the basin, it has been estimated that there was 25,000,000 board feet of redwood lumber growing there, more than enough to attract the attention of early loggers. The basin was also part of the Soquel Augmentation land grant, but it was included in land that passed from another of Martina's daughters to Augustas Noble and eventually to Roger Gibson Hinckley and his son-in-law John Lafayette Shelby in 1858. Hinckley and Shelby built a water-powered sawmill beside Soquel Creek just north of its junction with present-day Hinckley Creek. They brought Hinckley Creek water down through a millrace and tunnel into the sawmill.

The Loma Prieta Lumber Company eventually acquired the property, and when their operation in the Aptos canyon neared its end in the late 1890s, they began to explore ways of cutting the logs in the basin and moving them over the ridge and down to the Loma Prieta mill. After having an engineer explore even the possibility of drilling a tunnel through Hinckley Ridge, the company abandoned the idea and in 1900 disassembled the Loma Prieta Mill and moved it around to the lower Hinckley Basin.

As the Hinckley Basin operation had no railroad connection, the lumber was loaded on to wagons and freighted down the Soquel Valley to a large lumberyard built on the cliff at a place called Opal. (Present-day Opal Cliffs.) From there it was shipped by rail to the company's various lumberyards in the Monterey Bay Region. The company began to cut farther up into the Hinckley Basin, and by the winter of 1905-1906, approximately forty percent of the redwood had been cut.

The winter of 1905-1906 was a particularly wet one, and on January 18, 1906, Hinckley Creek rose up and washed out the mill and a good part of the lumber camp. Anxious to have the mill up and running by the start of the 1906 cutting season, the company gathered up the

equipment and began rebuilding. The new lumber mill was rebuilt on a bench above the creek bottom on the north side of Hinckley Creek.

Earthquake – April 18, 1906

In the early morning of April 18, 1906 as the lumber camp awoke, the canyon wall opposite the lumber mill collapsed with a roar “like the wind.” Carrying trees that rode erect down the mountainside, the mass of boulders, mud and earth rushed into the creek bottom and up the north side, crushing the lumber camp against the canyon wall. Nine men were lost beneath the mud and earth, and after a day of frantic digging, the company began a lengthy effort to recover the bodies. The landslide effectively blocked Hinckley Creek, creating a lake that eventually reached a depth of over 50 feet. The Loma Prieta Lumber Company crews worked for almost a year before finally retrieving all but one of the bodies believed to be beneath the slide, along with some of their logging equipment. The earthen dam was eventually sluiced away using hydraulic mining equipment and the water pressure of the lake itself.

Similar scenes were re-enacted throughout the Aptos Creek watershed, though, since no one was living or working there at the time, the reports were slower in coming. Huge sections of the north side of the Aptos Canyon near the second Monte Vista mill site fell into Aptos Creek (later named Big Slide), and for a time, the flow of Aptos Creek at its mouth slowed to a trickle. The creek itself eventually worked its way through those landslides. Fissures opened up beneath both White’s and Buzzard Lagoon and for the first time in anyone’s memory, both lagoons dried up. The flow in some wells in the Aptos vicinity increased, while others dried up. During the weeks and months that followed the huge earthquake, local residents hiked into the country and marveled at the fissures and escarpments. The County Game Warden walked up the East Branch of Soquel Creek in early May and returned with a report that the creek bed had been elevated from five to thirty feet along a quarter mile stretch. He also noted that not a tree in that area had escaped being “torn and twisted and shattered to pieces.”¹⁹

After the Loma Prieta Lumber Company surveyed the damage to the uncut forest in the upper Hinckley Basin, in 1907 they gave up logging there. For the moment the natural forces had won, leaving an estimated 15,000,000 board feet of unlogged redwood in the upper Hinckley Basin.

The Loma Prieta Lumber Company turned its interests to a logging operation over on the Santa Cruz County North Coast, and the Aptos Canyon-Hinckley Basin land grew quiet.

Reforestation

The incredible number of landslides on April 18, 1906, caused the Loma Prieta Lumber Company to becoming increasingly concerned about reforestation in their cut over property. With an eye toward not only stabilizing the land, but also growing another valuable crop, in 1909 the company planted approximately 50 acres of eucalyptus and acacia around the Loma Prieta town site. They planted another 30,000 eucalyptus seedlings in 1910. There was a statewide eucalyptus “boom” during this period, with millions of the trees planted with the hope that they would provide landowners quick and easy income on barren or cut-over land.

¹⁹ *Santa Cruz Sentinel*, May 9, 1906.

The wood turned out to be unsuitable for lumber, however, and the Loma Prieta Lumber Company stopped its reforestation efforts, trusting that the redwoods would resprout soon enough. Today there are still several eucalyptus groves in the park, a testimony to the waxing and waning of the eucalyptus boom.

Molino Timber Company – 1910-1917

Without a supply of lumber, the Loma Prieta Lumber Company began to sell off its lumberyards and equipment. But there was still that uncut lumber in the upper Hinckley as well as stands of uncut trees along China and Santa Rosalia ridges. For five marginally-employed men who had worked for the Loma Prieta Lumber Company, the temptation was too great, and in 1910 they worked out a scheme where they would purchase the uncut trees from the company, drape an incline against the nose of China Ridge and put a narrow-gauge railroad atop the ridges. The plan was to produce only split stuff – shakes, ties, pickets, posts and grapestakes—and then lower them a carload at a time down the Incline and out to market. The Loma Prieta Lumber Company agreed to buy all they could produce, so in 1910 the Molino Timber Company was incorporated and began its operation.²⁰

In some ways this operation was a throwback to the 1850s when almost all the redwood being produced in the Santa Cruz Mountains was split. The only nod to modernity was the huge steam winch (called a “bull donkey”) that sat atop the incline, lowering and raising railroad cars all day long. Unlike the Loma Prieta Lumber Company that had literally moved mountains to lay track down in the Aptos Canyon, the Molino Timber Company delicately followed the natural contours, draping its tiny railroad line around curves, and using whatever was handy – even stumps – to support the few necessary trestles.

Perhaps the most amazing part of the operation was the huge cable that they suspended across the upper part of Hinckley Basin. Using a block, tackle and sling arrangement, they cut and split the trees in the upper Hinckley and then raised the split stuff up to the level of their little railroad. Eventually they laid over ten miles of thirty-inch narrow gauge along the ridgetop, but they trod so lightly on the land that there is almost no evidence remaining of their operation. Other than a few, narrow cuts, and the groove left by the incline itself, the scars of the Molino Timber Company have healed over.

The Last Loma Prieta Lumber Company Campaign – Bridge Creek – 1917-1922

The lessons of the Molino Timber Company were not lost on the directors of the Loma Prieta Lumber Company. So, after a lengthy negotiation with the heirs of Frederick August Hihn, the company purchased the west side of Bridge Creek and its estimated 15,000,000 board feet of redwood. Included in this tract was a cluster of huge redwoods, one of which was measured at eighteen feet in diameter. The company then purchased all the Molino Timber Company’s rolling stock, and extended their broad gauge line with a narrow gauge up Bridge Creek. However, because they were milling the huge logs at their old Loma Prieta mill, an incline would not be feasible to reach the huge trees halfway up the ridge. Instead they put in a switch back, and the tiny locomotive, clanked laboriously up and around the ridge, eventually turning what had been called Big Tree Gulch into Big Stump Gulch.

²⁰ Shelburne, D.J. “Molino Timber Co.”, *Pacific News*, Volume 11, No. 8, August 1971. Stoodley, A. Typescript notes.

Finally, in 1922, the four-decade assault on the landscape was over. The Loma Prieta Lumber Company began selling off its equipment and removing its tracks, and the land began the slow process of healing.

Already, in the lands cut in the 1880s, the green fringe of redwood sprouts were growing quickly upward, creating a second-growth forest, the forerunner of what we see in the canyons today.

The Last Big Fire – September 1922

Wildfire had been a regular visitor in the Aptos and Soquel Canyons since the Native Americans began burning off the meadows thousands of years ago. And logger fires had sometimes gotten out of control and swept across the mountain ridges. The last major fire occurred in September 1922. It began in Hinckley Gulch on September 10 and burned for seventeen days, reaching as far east as Buzzard Lagoon, and burning down into Bridge Creek and north into the East Branch of the Soquel before it was finally extinguished. The fire burned over an estimated 7,000 acres, much of it previously cut over land that had sprouted a dense cover of brush. Of that property, the Loma Prieta Lumber Company estimated that 4,000 acres belonged to them. The charred stumps and trees in the upper part of Bridge Creek stand in mute testimony of that canyon's last major fire.²¹

Recovery - 1922 – 1951

By the mid-1920s the Loma Prieta Lumber Company had but one employee in the Aptos area, the company's secretary, Albretto Stoodley. Stoodley's duties included maintaining some security on the property as well as keeping the bridges in some repair. He also was responsible to show the property to interested buyers, and sell off any of the equipment and buildings that he could to generate enough income to pay the property taxes and his own salary. From his written accounts, interviews and correspondence, we can assemble a good picture of what the intervening three decades were like. He and his family spent their summers on the property, and in his own words, "Loma Prieta had much to offer." They hiked and drove all around the canyons, marveling at the still-visible scars from the 1906 earthquake, and watching the railroad grades become overgrown with vegetation.

Apparently, up into the 1940s, the fishery had not yet recovered as he noted:

*"There were the miles of fishing stream—poor fishing, of course, because [the stream] was not regularly stocked."*²²

Stoodley disassembled a number of the old logging structures, or sold the buildings for their lumber to local farmers.

The records contain a variety of agreements with salvage loggers willing to dismantle old structures for their timbers, or dig around in the bottom of the mill pond for "sinkers" that

²¹ *Santa Cruz Sentinel*, September 10, 1922, ff.

²² Albretto Stoodley, typescript notes titled "Loma Prieta", undated and unpaginated. A photocopy in the possession of the author.

were still sound. Most of these logs were carried out of the canyon by truck to small sawmills nearby.

During the 1930s and 1940s the most regular users of the Loma Prieta properties were Italian tanbark cutters who negotiated yearly contracts with the company to cut tanbark and haul it out by mules. The bark was then trucked to Salz Tannery in Santa Cruz. These bark camps were scattered throughout the woods, and, according to Stoodley (he negotiated the contracts and monitored their work) the men worked either singly or in small crews, at their own pace. There is still evidence of these camps throughout the forest, and even today, one of the bark camp cabins from this era is still standing.

Fern collectors working for local nurseries also combed the woods, though usually without permission, as did redwood burl hunters who worked with hammer and hatchets to cut off the burls and sell them to souvenir shops. Deer hunters came into the forest when the season opened in August, and then in September, the sound of shotguns could be heard on the ridge tops at the opening of band-tailed pigeon season.

Old-timers who rode motorcycles still speak in loving terms of being able to ride through the Loma Prieta property in the 1940s, crossing perilous trestles and jumping streams. Many of these visitors picked up pieces of the logging history and took them home: beams, boards, hardware, spikes, rail, doors, and window frames.

A Possible State or Federal Park

When California voters passed the first state park bond act in 1928, there was no mention of the Loma Prieta Lumber Company properties as a possible acquisition. The land had been logged, after all, and there were many acres of old-growth redwood forests to be saved elsewhere in California. But, by the 1930s, the company's correspondence contains references to a possible sale to the Federal Government. In 1934, a formal offer was made to the United States Government to sell the property for \$28.50 per acre. There is no further mention of this particular offer, but the idea of selling the property to a government agency for a park grew stronger each year.

Beginning in 1936, the California Division of Forestry began guiding Federal New Deal crews (Civilian Conservation Corps and Works Project Administration) in the construction of firebreaks and fire roads throughout the Loma Prieta property. Eventually the California Division of Forestry invested \$50,000 of its own funds to build three wooden bridges across Aptos Creek (1942) and finally replacing the highest of those with a steel bridge in the summer of 1950.

For a time during the 1940s there were serious discussions on the part of the California Division of Forestry to combine the Loma Prieta Lumber Company's property with adjacent lands to the north to create a huge, 75,000 acre "Loma Prieta State Forest." But, with local opposition by organizations such as the Santa Cruz County Farm Bureau (they were worried about the loss of upper watersheds and the possible depletion of downstream water)²³, the plans died out by the end of the decade. Offers to purchase smaller portions of the company's

²³ *San Jose Mercury Herald*, February 15, 1943.

property were declined, as the trust officer believed the land would be more attractive to a government agency if it were intact.

The possibility of a sale as a park of some kind also began to impinge on the salvage lumbermen and bark cutters. Since the company wanted to present the land in the best possible light to prospective government purchasers, they began to turn down those wishing to harvest trees of any kind on the property.

Finally, in 1948, as the prospects for some kind of government purchase grew dim, the trust officer of the Loma Prieta Lumber Company hooked its future to geologist's claims that there was oil in those hills. The company leased 3,000 acres of the property to Union Oil Company for oil and gas exploration. The terms of the agreement were an annual rental of \$1 per acre until actual drilling commenced and then 1/8 of all the royalties earned on what was produced on the property.²⁴ With the deposit of the first rent check for \$3,538 in 1950, the company's bank account was again healthy.²⁵

Hinckley Basin Revisited – 1926-1950

The decade of the 1920s saw a wave of recreational development sweep through Santa Cruz County. From the seaside communities of Aptos-by-the-Sea to Capitola to Santa Cruz itself, moneys were being invested in summer time attractions for newly mobile, automobile-borne California tourists. In 1926, the Loma Prieta Lumber Company sold the 2,500-acre Hinckley Basin to a group of local investors who in turn sold it the following year to Henry Allen Rispin. Rispin was the driving force behind a revitalized and refurbished Capitola, with his single most enduring legacy being a huge 26-room mansion that still bears his name. Rispin then spent \$30,000 to create subdivision in the Hinckley and turn one of the small natural lagoons into a full-fledged lake. Unfortunately for Rispin, the Great Depression came before his plans were completed, and when he defaulted on this original loan, the property returned to the original investors.

During the 1930s, several other investor groups took a fling at the Hinckley, improving the lake, installing a water system with flume, and even building a number of summer cabins. In 1945, one of the owners of the property described the lake as being five acres in extent and twenty-five feet deep. But the rugged and relatively inaccessible Hinckley Basin would not surrender to the efforts to establish some kind of recreational center, and in 1950 the investors were still looking for a buyer.

The Marks Family Reassembles the Property – 1951-1963

Led by the widow Nisene Marks and her three adult children, the Salinas-based Marks family began a lengthy series of acquisitions in the Santa Cruz Mountains by purchasing the failed Hinckley Basin recreational acreage in 1951. In 1954 they purchased the remaining 6,500 acres owned by the Loma Prieta Lumber Company. Eventually, in great contrast to the usual California pattern of divide and subdivide, they created a holding of 9,472 contiguous acres, stretching across three watersheds. After a brief, unsuccessful fling with the Western Gulf Oil Company which saw several wells drilled along China Ridge, the Marks children decided to

²⁴ Letter, Percy Wood, Wells Fargo Bank Trust Officer to Albretto Stoodley, August 4, 1948.

²⁵ Deposit slip to Wells Fargo Bank from Union Oil Company dated August 5, 1950.

offer the land to the State of California for a State Park. The idea was to dedicate the park in the memory of their mother, Nisene, who had died in 1955 at age 96. Finally, in 1962, the Nature Conservancy took an option on the property, and in 1963, the land was deeded, with restrictions, to the State of California.

Aptos Renaissance - 1960 – 1965

The Great Depression of the 1930s effectively slowed the Aptos development boom of the 1920s. Other than the seasonal fruit-packing industry that serviced the orchards in the Valencia and Day Valley areas, the old Aptos Village area was quiet compared to those busy, noisy years when logging was the dominant industry. The village and surrounding area slipped farther into the economic doldrums in 1949 when Highway 1 was moved to the new freeway and the old Santa Cruz-Watsonville highway became Soquel Drive.

All that began to change in 1960 when the newly formed Cabrillo Junior College Board of Trustees selected the Porter-Sesnon property as the site of their new campus. Aptos literally exploded. By 1962, Rancho Del Mar Shopping Center and Resurrection Catholic Church bracketed the main intersection off the freeway, and much of Soquel Drive had been widened to four lanes. And with the college came the demand for housing, with new subdivisions opening up on the hills to the west of the Park. Housing developments, such as Vienna Woods, were built to the top of the ridge on both sides of the Aptos Canyon.

The Park was very much a part of this Aptos Renaissance, helping to bring increased attention to the area following the Park's first being announced in a *San Francisco Chronicle* article in July 1962.²⁶

The Forest of Nisene Marks State Park – 1963 – 1982

The Deed Restrictions

The Marks family's gift of land to the people of California was conditioned upon a series of statements and restrictions placed in the deeds. In a prescient and eloquent passage, the donors seemed to be aware of the changes coming to Santa Cruz County and the pressures that development was already placing on the Aptos area:

WHEREAS, said conveyance is motivated by the affection of Donors for said real property and their intention that said real property be preserved for all time as a natural preserve, notwithstanding any future change of use of any surrounding properties and notwithstanding that increased population and other causes may bring about such changed use in future years.

The donors then enumerated a series of specific restrictions for the use of the property:

That the Property shall be a portion of a State Park to be known as "The Forest of Nisene Marks";
That adequate standards for public health and safety shall be maintained thereon;

²⁶ *San Francisco Chronicle*, July 21, 1962.

*That there shall be no horseback riding thereon;
That the use of the Property shall be limited to camping, nature study, hiking
and associated activities;
That any development of the Property in connection with said activities shall
be in keeping with its natural surroundings;"*

The third restriction, the prohibition of horseback riding, was somewhat unusual and caused continuous speculation on the part of park staff and the public. In interviews in the late 1970s, both Herman Marks and the realtor, Don Thompson, explained that the Marks family had nothing against horses per se, but that they were concerned about the damage that horses might do to the hiking trails in the Park.²⁷ The deed restrictions became the template for the Park's early management, and the state flagged the Park with the word "Undeveloped" on its maps for several decades. Interpreting exactly what "undeveloped" meant became one of the major tasks facing the California Department of Parks and Recreation as they assumed the responsibility for the property.

It is in the context of the Marks donation and the deed restrictions that the Soquel Augmentation Line achieves its heightened importance. Except for the narrow railroad right of way that connected the initial Marks donations with Soquel Drive to the south, the entire original Park was located above the Augmentation Line. Therefore, any properties added to the Park below that line would not fall under the deed restrictions.

For the first couple of years, the Department worked to survey the new Park boundaries and inform the local public of the land's new status. The Park property had been something of a public playground in the 1950s, and the CDF fire road was a favorite of adventurers in jeeps and motorcycles. Park personnel began to post signs and inform the local population of the new regulations. The logbooks kept by the park's first full-time ranger, Nils Bergman, are filled with encounters of vehicles. In September of 1965, for example, Bergman came upon two Model T Ford automobiles "put-putting along" deep inside the Park on their way to Watsonville.²⁸ By October 1967, a series of gates were installed, but well into the 1970s the Park log books contain encounters with uninformed riders and drivers.

The remote canyon had also been favored by car thieves for stripping and dumping stolen vehicles, and Ranger Bergman's early logs note such things as a 1965 Chevelle dumped in the Park in March of 1965.

During these early years, The Forest of Nisene Marks State Park was known and used by a handful of hikers, most of them local. Periodic Sierra Club hikes lead by local residents, such as Bill Colvig, helped introduce new visitors to the Park, but compared with the extremely popular Seacliff State Beach to the south, the Park was not only undeveloped, but undiscovered. Framed by a pair of large timbers (one of which still remains at the Park entrance) and two river-rock pillars (both of which were later removed), the Park entrance was not easy to find.

²⁷ Marks, H. Interview; Thompson, D. Interview.

²⁸ Bergman, cite, September 5, 1965.

The Aptos Creek Dam Proposal – 1965

The first test of the Marks deed restrictions came in a letter from the Santa Cruz County Public Works department in November 1965. The county was exploring the possibility of building a dam in the Aptos Canyon that would create a 100-acre reservoir, all of it inside the property donated by the Marks family. The Nature Conservancy responded with a forceful letter in early 1966 stating that such a dam would “break the trust” of the Marks family, and the following month, Fred L. Jones, the Director of California State Parks, wrote a similar letter to the County of Santa Cruz. Though the County pulled back its immediate plans to build a dam, the dam site remained on the County’s General Plan maps for the next 14 years. It was finally removed in early 1980.²⁹

The Citizens Advisory Committee - 1969

In a move reflective of the national trend to democratize local and regional organizations, California Department of Parks and Recreation Director, William Penn Mott formed a citizen’s advisory committee for The Forest of Nisene Marks State Park in 1969. This was the first such committee in the state park system. The committee had twelve, Department-appointed members representing not only local and regional conservation organizations, but also the canyon’s early logging history. Diane Porter Cooley, a descendant from the Porter family that managed the Loma Prieta Lumber Company in the 1880s was a member, as was Herman Marks, one of the Park donors.³⁰

The primary tasks of the Advisory Committee in the early years was establishing a trail system, agreeing on place names within the park, and monitoring development proposals such as the Aptos Creek dam and subdivisions proposed adjacent to the park. In 1971, William Penn Mott gave the committee its primary charge:

“... I hope that the committee will now take on the responsibility of developing for us a planning prospective for this park giving us the benefit of your experiences and knowledge of the area to provide a basic guideline for the planning and future development of this area.”³¹

The Committee took its charge seriously, exploring the Park’s upper reaches and holding many of its meetings in the Park itself.

West Ridge Trail – 1971

The committee’s first major public event came in April 1971 when its members helped coordinate a large, weekend trail day. An estimated 700 Boy Scouts plus hundreds of other volunteers spent the weekend building new trails, and a Saturday evening campfire program was highlighted by comments by Director Mott. The primary focus of the weekend’s work was on building a new trail above Bridge Creek that was eventually named West Ridge Trail.

²⁹ *Central County News*, January 20, 1965; February 3, 1965; *Watsonville Register-Pajaronian*, February 19, 1980; *Green Sheet*, February 27, 1980.

³⁰ Porter-Cooley, D. Interview, 2002.

³¹ Letter, William Penn Mott, Jr. to Chris Hodgson, Chair of the Citizens Advisory Committee, April 23, 1971.

Since the entire park was located north of the Augmentation Line, the early focus was to provide parking north of the first stream crossing. Eventually, parking areas were laid out across the road from the Loma Prieta Mill Site, and at the Loma Prieta town site. The stream crossing proved to be a continual source of difficulty and rangers spent a lot of time pulling out cars of motorists who became stuck in the middle of Aptos Creek.

The TMI Debate – 1970-1976

Besides the proposed dam, the other major development issue that the Advisory Committee monitored was a 52-acre residential development proposed by the Teacher's Management and Investment Corporation (TMI) in 1970. TMI purchased 54 acres along Aptos Creek in 1969 for \$250,000, and the following year applied for a planned development permit that included two 9-hole golf courses, and a 396 unit residential complex.³² Though TMI eventually got a permit for a scaled-back development, the project was stalled by a mid-county sewer moratorium in 1972. Further permit requirements and opposition by the Park's advisory committee further slowed the project until TMI finally abandoned its plans and The Forest of Nisene Marks State Park eventually acquired the land.

During the 1970s, the Advisory Committee continued working for further acquisitions in the canyon corridor between Aptos and the Steel Bridge. Slowly, a parcel at a time, and with the assistance of the Save-the-Redwoods League and Sempervirens Fund, the narrow entrance to the park was expanded, particularly between the original railroad right of way and Aptos Creek.

The Floods of January, 1982

Man-made cataclysms such as logging and bulldozing ceased with the Park's formation in 1963, but natural events paid no heed to changes in ownership or deed restrictions. A huge, warm, tropical storm slammed into Santa Cruz County on January 3, 1982 and before it was over, an estimated fifteen inches of rain fell in the upper reaches of The Forest of Nisene Marks State Park. Rain fell so quickly that the rain gauges filled and spilled over before they could be read, so we will never know exactly how much rain fell during those three days. Most of the seventeen people who died in the storm were buried in a huge mudslide in the San Lorenzo River watershed.

Aptos Creek became a snarling, raging brown monster, tearing out creek banks and hurling entire trees, roots intact into the stream. Many of those trees and logs eventually congregated in logjams all along the creek with the largest building up behind the Spreckels Drive bridge near the creek's mouth.

The best measure of the 1982 flood up in the Aptos Canyon was the historic structures and monuments that were carried away. Railroad trestle footings that had stood above Aptos Creek since they were built in the 1880s disappeared, as did old logging structures all along the area's streams. Seven extant logging camp structures along Bridge Creek were swept away.

³² *County News*, Aptos June 25, 1969; *Watsonville Register-Pajaronian*, July 8, 1970.

If the structures that were carried away were any measure, this was indeed the largest such event in the intervening century. Bridge Creek rose over 15 feet above its bed, tearing out old buildings and leaving mud marks high on tree trunks that are still visible today. Footbridges were swept away, and when the water receded, the steeper canyon walls up in the Aptos Canyon had been swept clean of vegetation.

The park was closed for almost a year, and even when it finally reopened to the public, the Advisory Committee and park staff decided to close the gate at the Porter Picnic Area, diminishing automobile access by a mile, and eliminating the requirement for the public to drive through the first stream crossing. By this time enough property had been acquired south of the Augmentation Line that the Committee felt there was sufficient parking available to replace the two main lots at the Town Site and the Mill Site. It took several years to repair and replace the trails that had been lost. The Aptos Creek trail was the most heavily damaged, and was not back in good repair until 1986.

The Wilderness Proposal – Summer and Fall 1982

Inspired, in part, by the removal of many of the historic structures by the floods in January of 1982, the California Department of Parks and Recreation issued a report in August of that year recommending that most of the Park be placed in a wilderness designation. The report, *Upper Aptos Creek Roadless Area: The Forest of Nisene Marks State Park* recommended setting aside most of the upper Hinckley and Aptos Creek watershed in a wilderness, an area totaling approximately eighty percent of the Park. All roads would be removed from the 8,270-acre wilderness, and rangers would be required to patrol the area on foot.

After holding a public information meeting on October 18, 1982 to get the opinion of the general public, the Advisory Committee went on record opposing the wilderness designation. The committee felt that the Marks deed restrictions were protection enough, and that by removing the Fire Road, it actually hampered the ability of the Department to patrol and protect the resource.

On November 5, 1982, the California State Parks and Recreation Commission met in Santa Cruz, and following a presentation by Advisory Committee members, the Commission voted to remove from consideration the wilderness designation for The Forest of Nisene Marks State Park.³³

The Forest of Nisene Marks State Park – 1983 – present

Pelican Timber and the East Branch of Soquel Creek

One reflection of the increasing pressure being brought on properties bordering on the Park was the acquisition of the Soquel Creek watershed immediately to the north by Pelican Timber Company in 1979. Pelican's plans were to selectively log the property and then subdivide it into large home sites. The floods of 1982 alerted citizens living downstream in the Soquel watershed, and they began pressuring the Board of Supervisors about the dangers of upstream logging and development.

³³ Hughes/Hodgson Collection, File 9 titled "Wilderness Area."

The Citizens Advisory Committee for The Forest of Nisene Marks State Park watched Pelican Timber's plans with great interest. Finally, after receiving a chilly reception from the County of Santa Cruz about their logging and development plans, the timber company announced that it was putting its property on the market. The Advisory Committee recommended that the Department of Parks and Recreation purchase the property and add it to The Forest of Nisene Marks State Park. Since the Pelican property would not have the severe restrictions that the original Marks property had, the Department could then satisfy horseback riders and mountain bicyclists by allowing those uses in the new property. State Senator Henry Mello supported the acquisition, as did a number of local politicians. The *Watsonville Register-Pajaronian* editorialized that the Pelican property "cries out for public acquisition."³⁴

The Committee's hopes were dashed by a Department report published in June 1986. Titled *East Branch of the Soquel Creek Watershed Feasibility Study*, the study concluded that the property was "*not considered a sufficiently significant natural resource to justify acquisition of the area for public purposes.*" Neither did the property have any potential as a State Park: "*Based on the heritage resources and recreation potential, the Soquel Creek lands are only marginally suitable as an addition to the Forest of Nisene Marks State Park.*" The report recommended against acquisition of the Pelican property by the Department of Park and Recreation.

Eventually, however, under the leadership of Assemblyman Sam Farr, most of the Pelican Timber Company holdings passed to the administration of the California Department of Forestry and Fire Suppression. In 1990 the 2,681-acre Soquel Demonstration State Forest was dedicated on the northern boundary of The Forest of Nisene Marks.³⁵

The Loma Prieta Earthquake – October 17, 1989

Then, to remind everyone of the theme of the land's underlying geological forces, at 5:04 PM on October 17, 1989, one of the faults that runs diagonally across Aptos Creek ruptured far below the earth's surface, and, in the words of one runner who happened to be in the Park, "All hell broke loose."

The trees whipped and snapped and dead limbs and snag tops came crashing to the forest floor. Huge boulders, some of them bigger than houses, came tumbling down the canyons and everywhere the canyon walls slid away, creating clouds of choking dust. Geologists later determined that the earthquake's epicenter was eleven miles deep in the earth's crust directly beneath the park, but even the most casual observer could see that something truly cataclysmic had happened. And, just like those observers described in April of 1906, huge fissures ripped open along ridge tops, and the land settled creating long escarpments. The bottom part of the 1906 Big Slide on Aptos Creek lived up to its name and slid away again. Over on the Hinckley another massive slide punctuated the south canyon wall, leaving a jumble of trees stacked at the end of the creek. When seen from the air, the bare earth of landslides pockmarked the entire landscape.

³⁴ *Watsonville Register-Pajaronian*, November 29, 1984.

³⁵ For the complete story of the creation of the Soquel Demonstration State Forest, see *Soquel Demonstration Forest: Final General Forest Management Plan*, Soquel, November 1996.

And, as yet another reflection of shifting strata far below the earth's surface, the flow of Aptos and Bridge Creeks increased. The creeks continued to flow well above their pre-earthquake levels into the winter.

The force of the earthquake caused the electric transmission lines crossing the Park to arc together, and the molten metal fell into the brush on the western boundary of the Park starting a wildfire. For the next day, helicopters and ground crews contained and put out the fire, keeping it to an estimated twenty acres.

Though the Park was closed immediately following the earthquake, within weeks the public began to stream into the park, hoping to visit "ground zero" of the event that had brought the entire San Francisco Bay Area to its knees. Hundreds and then thousands of people drove into the park, jamming the narrow roads. On some weekends, the line of parked cars on the road stretched all the way back to Aptos. Each article in a Bay Area newspaper – first the *San Jose Mercury*, then the *San Francisco Chronicle* – set off a surge of new visitors, and well into the winter, the crowds continued to come. Families with babes in arms, women in high heels and cocktail dresses, men in sport coats, they all stumbled up the Aptos Creek trail to a hastily made sign that marked the exact earthquake epicenter. (The sign's location actually was dictated by the state of the trail beyond that point. Once again, the Aptos Creek trail beyond Hell's Gate needed repair.) The numbers were beyond counting, and for a time the members of the Advisory Committee believed that, once discovered, The Forest of Nisene Marks State Park would forever be in the forefront of the mind of the California public. As time passed, however, Park usage fell back to more typical numbers, a testimony to the fact that most of those looking for more exotic sights such as earthquake crevices were not content to return for the comfort and solace of a recovering redwood forest.

The Formation of the Advocates for The Forest of Nisene Marks State Park and the End of the Advisory Committee

Meanwhile, throughout California, cooperative associations and outside advocacy groups were replacing the state-sponsored advisory committees. Following the formation of the Citizens Advisory Committee in 1969, approximately forty other such committees were formed throughout the state. However, with the advent of cooperative associations, the number of Citizens Advisory Committees declined until, in 1992, the committee for The Forest of Nisene Marks was the only one remaining in the state.

In 1994 several members of the Advisory Committee established the Advocates of The Forest of Nisene Marks State Park. The goal of this group was to work with, but outside the State Park framework, to assist in advising the Department about The Forest of Nisene Marks State Park. The founders believed that shifting from "advisory" to "advocacy" reflected the nature of the new committee and its role.

On November 20, 1995, Citizens Advisory Committee for The Forest of Nisene Marks State Park formally voted itself out of existence, thus ending the era of advisory committees that had begun with this same committee in 1969.

The New Advocates Era – 1992 to the present

With the advice and counsel of the Advocates, The Forest of Nisene Marks State Park received an injection of new energy. Trail work increased and new signs and interpretive panels sprouted throughout the Park. A new restroom facility and entrance kiosk opened in 1993, and under the leadership of the Advocates, a new bridge was built at the first stream crossing.

With the assistance of the Advocates and the Save-the-Redwoods League, in 1995 the park acquired a large parcel from the Pourroy family. The late Marcel Pourroy had lived on Viewpoint Road, and over the years had carefully managed the property. The property contains a number of large, old growth redwoods. The Advocates lead in the construction of a seasonal bridge to provide public access to the property and have recommended that the parcel be named “Marcel’s Forest” in honor of Mr. Pourroy.

The Changing Context – Santa Cruz County in 2002

When the Marks family donated the original property to the State of California in the early 1960s, the population of the Monterey Bay Region was an estimated 300,000, with Santa Cruz County’s population less than 90,000. Today the Monterey Bay Region has a population of 725,000, with Santa Cruz County’s population having tripled to 259,000. The increased population has brought an increase in the number of users in The Forest of Nisene Marks State Park, though daily use patterns still have not reached the levels of those months immediately following the Loma Prieta Earthquake in October of 1989.

Perhaps of more significance is the change in types of use. Where the predominant users in the 1960s were hikers, today they have been joined by runners and cyclists. Equestrians still make use of the lower areas of the Park, as do wintertime steelhead fishermen.

Historic Resources

The Forest of Nisene Marks State Park contains a wide diversity of resources representing the historic periods at the Park. Railroad grades, cuts and fills, townsites, logging camps, mill sites, and at least one standing structure testify to the occupation and use of this land from the Spanish Era to the present. While the Park is most often thought of in terms of natural and recreational resources, only a little searching reveals the fascinating record of human enterprise and sometimes folly. The Park also holds important historical locales, not of man’s manufacture - the epicenter of the Loma Prieta earthquake, and points on the landscape changed forever by the 1906 San Francisco earthquake and fire. Taken together, these historic resources are an important element of the Park, worthy of both preservation and interpretation.

The inventory of historic resources is incomplete, although we do know much about the major activities in the Park, such as the Loma Prieta Townsite and Mill, and the attendant railroads, roads, and related settlement. None of the resources have been formally recorded as archaeological sites, districts, features, or standing structures. Also, there can be no doubt that as yet unknown resources exist in the Park. But there is much more in the Park. Small, localized lumbering events are memorialized by fast decaying structural remains and refuse

dumps. While these resources are not drawn on the landscape as dramatically as the Loma Prieta Town Site and Mill, they, nonetheless represent their time and place, and are no less worthy of consideration in the management of the Park.

The list below summarizes what is known about the historic resources in the Park. For some the information is sketchy, for others the record is relatively complete. In each instance, the description is followed by a preliminary assessment of historic importance and a consideration of interpretive potential. The historic resources are listed in a general south to north order and are noted on the accompanying historic resources map.

Terms:

Historic Feature – designation used for an isolated object that is worthy of interpretation and protection.

Historic Site – designation used for a collection of features or an area worthy of interpretation and protection.

Historic District – designation for a group of contiguous sites that will require interpretation and protection as a whole. The Loma Prieta mill, millpond, town and Director's cabins, for example, operated as a unit in the 1880s and 1890s and could be protected and interpreted as such.

Hopkins Right of Way – Entrance Post

When The Forest of Nisene Marks State Park was established in 1963, the entrance road was framed by two, huge, square redwood pillars along with two river rock stone pillars. Over the years all the pillars and one of the posts were removed, leaving, presently just the one. It is often used to support public notices. The Department should make every effort to protect the remaining post.

Hopkins Right of Way – Split Stuff Fence – Historic Feature

When Claus Spreckels deeded the right of way through his property from the main railroad line in Aptos to the Augmentation Line, he sold it for \$1.00 in exchange for the Loma Prieta Lumber Company's agreement to fence the right of way. Built in 1883, several sections of this 1883 fence still survive along the west side of the park's entrance road, and represents the last original split stuff fencing in the park. Several sections of the fence were removed during the construction of the Village Glen development in the 1980s. The Department should make every effort to prevent any further destruction of the fence.

Mangels-Van Eck Redwood – Historic Feature

The Mangels-Van Eck Redwood was deeded to the Park in 1971, and was dedicated on June 30, 1971. A large plaque is mounted on a redwood panel, which has the Shell Oil logo beneath. Two other plaques, both cast in 1954, are attached to the tree well above the ground and are now screened by vegetation.

The tree represents the Mangels and Spreckels involvement in the early history of the land as well as the continuing involvement of the Mangels family. They have helped transfer several hundred acres of property to the park over the years. The Mangels-Van Eck Redwood is well marked and is a landmark in the Park.

Pourroy Historic Site – “Marcel’s Forest”

Beginning in the 1960s, Marcel Pourroy began making improvements to the small canyon that enters Aptos Creek just west of the present-day entrance kiosk. These improvements included several access roads, trails, and a picnic area beside Aptos Creek. The picnic area included a rectangular, stone barbecue pit, and a rock wall along the west side of the creek (just downstream from the present-day season bridge). Mr. Pourroy also introduced several species of plants in a natural bog at the top of the canyon, including rhododendrons and lilies. There are also a number of old-growth trees in this canyon as well as a stand of twisted second-growth redwoods. This area represents the work of an enlightened and caring 20th century steward of the forest.

Nichols Brothers’ Mill (present-day George’s Picnic Area) – Historic Site

From 1866 to 1878, the Nichols operated the first large-scale logging operation in the Aptos Canyon. They dammed the creek at this narrow spot and created a millpond. There are still examples of introduced vegetation on the site, including a large, old black walnut tree, probably planted by the Nichols. In the 1880s, the level area was used as a lumberyard by the Loma Prieta Lumber Company.

The site should be recorded as an archaeological site, with close attention to ancillary features that may be associated with the mill site. Recording should consider effects of Park user activities on the site. The site has high potential for interpretation to Park visitors using the picnic area. A small marker could be placed on or adjacent to the present sign explaining who George was. George’s full name was George Mason Haire, and his family donated sufficient funds to create the picnic area in his name in 1980. It was the family’s wish that it be labeled only as “George’s Picnic Area.”

The Steel Bridge – Historic Feature

Constructed in 1950 by the California Department of Forestry (CDF), this bridge is of a style known as a “Bailey Bridge.” The bridge represents a period from the mid 1930s to the mid 1940s when the California Department of Forestry was interested in acquiring the Aptos Canyon as part of a “Loma Prieta State Forest.” It was during this period that the CDF invested an estimated \$50,000 while constructing the Fire Road along with two wooden bridges and this steel bridge for access in case of wildfire. The two wooden bridges were eventually washed away by succeeding floods. This 1950 bridge is the only surviving bridge of that period. This feature has potential for interpretation to Park visitors.

The Loma Prieta Broad Gauge Railroad Grade – Historic Site

Beginning with the broad gauge cuts south of the Steel Bridge, there are a series of cuts and fills extending six miles up into the Aptos Canyon. The first large cut north of the Steel Bridge (and all subsequent cuts and fills) was constructed by Chinese railroad workers

between 1883 and 1897. The cuts and fills are so large as to often go unnoticed by park visitors.

This entire series of cuts, fills and creek crossings represents the enormous contributions of Chinese laborers in 19th century California, and this railroad grade is a superb example of their work. The grade also represents the remarkable power of the Southern Pacific Railroad Corporation and its ability to literally move mountains. The cuts, fills and trestle footings have not been inventoried for the purpose of evaluating impacts from user activities, particularly where mountain bicycles are carving “jumps” and loops into the faces of the cuts.

The cut immediately north of the Steel Bridge has high potential for interpretation to Park visitors as most of them walk through it without actually seeing it. The fill immediately north of that cut should also be interpreted.

Loma Prieta Mill Site

The Loma Prieta Mill Site was in operation from 1883 through 1922, and then episodically into the late 1940s. This mill was capable of cutting 70,000 board feet of lumber in a 12-hour day, and was the largest 19th century sawmill in Santa Cruz County. The mill was dismantled in the 1950s, and the remaining timbers were burned in an arson fire on September 14, 1969. All that remains of the mill are the charred supporting timbers.

The mill represents the apogee of America’s 19th century industrial age and the economic and technological power of the Southern Pacific Railroad corporation. It also represents the height of the corporation’s power and influence in the Monterey Bay Region.

The site currently has an interpretive panel that explains and illustrates the history of the mill. Several stands of exotic vegetation, including black acacia grow in and around the site. The vegetation should be cleared away so that the timbers can be seen by Park users.

Greater Loma Prieta Mill Site

At its peak in the 1890s, the Loma Prieta Lumber Company constructed numerous outbuildings, landings, and structures surrounding the actual mill. The flat across the Fire Road and just south of the mill was filled with stacks of lumber, while a number of buildings were built at the base of the hill to the east. The remains of the mill’s water tank (crushed by a tree) are located approximately one hundred yards up the hill. The hillside is now dominated by clumps of exotic species including eucalyptus and acacia.

Loma Prieta Town Site

Loma Prieta was an active company town from 1883 through 1900, and at its height supported a population of upwards of 300 people. There were over 60 buildings including railroad depot, stores, saloon, telegraph office, school and church. All the buildings were owned by the Loma Prieta Lumber Company. The town perched on the level bench above Aptos Creek and was connected to the west side of the creek by a long, broad gauge trestle. Evidence of the town can be found on both sides of the Fire Road from the mill site to beyond the town site proper.

Loma Prieta was a classic company town and one of few such company towns in Santa Cruz County. As such it is yet another representation of the industrial age coming to the Aptos Canyon and the Monterey Bay Region.

The last of the structures was removed by Park staff in the 1960s. Since the 1960s, bottle hunters and other illegal collectors have dug into the hillside below the town site searching for the detritus of the town. During the summer of 2001, a team of trained volunteers did a preliminary survey of the town site, locating the corners of several of the major structures as well as uncovering numerous historic artifacts in the surrounding vegetation. This site has enormous potential for interpretation to Park visitors.

Trails have been cut through the site in a haphazard fashion, and in one place, the railroad grade is being used by bicyclists as a “jump”, cutting a groove into the earthen rampart.

Trestle Remains, Love Gulch

The long trestle that crossed Love Gulch was the third major railroad trestle between Aptos and Loma Prieta. In the 1970s the remains of this trestle were hauled up out of the gulch and piled beside the Loma Prieta Trail on the north side of Love Gulch. Today there are a dozen timbers in the pile, some measuring fourteen inches by fourteen inches square.

These timbers represent the last remaining broad gauge trestle timbers in the park, the remainders having been either salvaged, or washed out by the storm of January 1982. They demonstrate the enormous size of standard gauge trestles used by the Southern Pacific Railroad, and can be used as comparisons with smaller narrow gauge trestle remnants elsewhere in the Park. They are also one of the last remains of the Chinese-built trestles, as Chinese labor built the pre-assembled bridges. These timbers should be protected by Park staff. The site has potential for interpretation to Park visitors passing along the Loma Prieta Trail.

Remnant Eucalyptus Grove – Loma Prieta Grade Trail

Just north of Love Gulch there are a half-dozen very tall eucalyptus trees growing on either side of the Loma Prieta Grade Trail. The trees are remnants of the thousands of eucalyptus planted as a reforestation project by the Loma Prieta Lumber Company in 1909-1910. The trees represent the eucalyptus “boom” that swept California between 1907 and 1912, and efforts of reforestation promoted by the California State Forester.

Millpond Site – Loma Prieta Grade Trail

Just off the Loma Prieta Grade Trail above the site of the millpond, there are a half-dozen large redwood logs anchored at the edge of the railroad grade to provide a slide down which logs were rolled into the millpond. The slide was in use almost continuously from 1883 to 1920 and shows up in several of the 1890s photographs of the Loma Prieta Mill. As the sapwood in the logs rots away, several large spikes have emerged to demonstrate the size and weight of late 19th century logging paraphernalia. The log slide should be protected by Park staff. The site has potential for interpretation to Park visitors using the Loma Prieta Grade Trail.

Historic Site – Stoodley Cabin

During the 1940s and 1950s, Albretto Stoodley, the caretaker of the property for the trust of the Loma Prieta Lumber Company, built a summer home in this railroad cut. Over the years, the cabin has fallen down until it is completely collapsed. It is an interesting interpretive location for visitors as, though it appears to be “old” it is actually relatively recent. Part of the reason for this misunderstanding is caused by the extensive use of recycled lumber in its construction.

This site could be interpreted in such a way as to honor the stewardship and legacy of Albretto Stoodley. The cabin site should not be placed on official park maps until efforts are made to mitigate the possible vandalism to the site as well as the danger to visitors of many boards with nails.

Historic Site – Director’s Cottages

From 1883 to 1900, the Directors of the Loma Prieta Lumber Company rode the train up to the siding below the three houses that sat west (and above) the railroad grade. They held their annual corporate meetings at this spot. The Warren Porter family owned one of the cabins, and the Porter family eventually donated the property to the state in the 1960s. The cottages had a picket fence surrounding them, and they were landscaped with ivy and roses.

The site is currently overgrown with vinca, but there is at least one remnant rose bush on the far northern end of the site that represents the time when the Directors met here. There is also an interpretive panel on the trail below the site. The site is significant as it represents the corporate power and influence of the Southern Pacific Railroad and the John T. Porter family of Watsonville.

Historic Site – Narrow Gauge Railroad Line – Loma Prieta Trail to Big Stump Gulch

The narrow gauge railroad spur on the west side of the Bridge Creek canyon is the last and best-preserved narrow gauge line in the county. The line operated from 1918-1920 and the cuts and fills are still visible all along the trail. There are also stump-based trestle footings and some trestle timbers in the bottoms of the ravines. This railroad grade is illustrative of the “appropriate technology” approach taken by the Loma Prieta Lumber Company in its last major logging show 1918-1924.

The trail follows the railroad bed for most of its length to Big Stump Gulch, about .5 miles beyond Hoffman’s Historic Site.

Historic Feature - Water Tank Frame along Hoffman’s Trail

Approximately 1.5 miles up the trail to Hoffman’s Historic Site, on the south side of the trail is an A-frame structure beside and just above the trail. The structure once supported a water tank that supplied water to the narrow gauge locomotive that operated along this line from 1918-1920.

Historic Site – Hoffman’s Historic Site

Constructed in 1918 and closed in 1921, this was the site of a major logging camp operated by Mr. and Mrs. Hoffman for the Loma Prieta Lumber Company. Several dozen buildings once stood here, including a 120 foot-long bunkhouse. Snow storms, natural deterioration and vandalism have reduced the standing buildings to piles of lumber over the past 25 years.

The entire site, from well above the old bunkhouse to the flat area where an oxen corral once stood, is an historic site. Every effort should be made to prevent further deterioration of the site, and interpret it to Park visitors.

Historic Site – Big Stump Gulch and Big Stump

Approximately one mile beyond Hoffman’s Historic Site, the narrow gauge railroad ended in a gully once known as Big Tree Gulch. The Loma Prieta Lumber Company cut the huge trees in the 1918-1920 logging operation. Several of the original trees exceeded 15 feet in diameter, and there is a massive stump adjacent to the trail where it crosses the gulch. They represent the cutting of the last huge original old growth trees in the Aptos Canyon, and stands in mute testimony to the failed efforts of the Hihn family to preserve the huge trees. The huge trailside stump and others uphill behind it were all badly burned in the fire of September 1922. This was the last major fire in what is now The Forest of Nisene Marks State Park.

Park managers should protect these stumps and interpret them to the public. The themes of preservation versus economics could be interpreted as well as the absence of fire in the canyon since 1922.

Historic Site – Bridge Creek Historic Site

Located on the banks of Bridge Creek where Big Stump Gulch enters the creek, the site still exhibits some railroad rail and footings of a large camp that was there in the 1918-1920 period. The flood of January 1982 removed most of the buildings that were standing at that time.

This site also represents the “appropriate technology” adopted by the Loma Prieta Lumber Company during the period as well as the overwhelming forces of nature that periodically visit the Park.

Historic Feature - Bridge Creek cribbed log trestle

Just downstream from the Bridge Creek Historic Site is the last extant trestle from the 1918-1920 period. Sometimes called the “Lincoln Log Trestle” because of its resemblance to the toy of the same name, the cribbed trestle once bore the weight of a loaded narrow gauge railroad train. Again, the theme of “appropriate technology” is apparent here as the cribbing is resting on several large stumps. The trestles were built to get in, get the logs, and get out.

Park management should protect the trestle, and there should be interpretive materials placed here to emphasize the transition of the huge, standard gauge railroad line to a much more delicate narrow gauge railroad.

Historic Feature – Bottom of the Incline

Because the later Fire Road cut through much of the lower end of the Incline, there is little evidence of it today. The interpretive panel that currently stands at the intersection of the Fire Road and the Aptos Creek Trail interprets the incline.

Historic Site – Top of the Incline

The 2,000-foot long incline that was laid on the nose of China Ridge from Aptos Creek to a spot 600 feet above represents the power of local knowledge and adaptive technology. The huge steam donkey sat on a flat that is now above the road cut, while the groove into which the railroad tracks for the incline were laid slides away to the southeast down the mountainside.

Historic Features – The Drilling Pads

The Fire Road follows along the western flank of China Ridge, and in two places is punctuated by two large, concrete footings. These footings were the location of two of the oil well test holes drilled during the 1950s when Andrew Marks was interested in exploring for oil. The sites are frequently hit by the road grader, and though they might seem to be “in the way”, they should be preserved. The site has interpretive potential, particularly for the oil exploration in these mountains during the 1950s.

White’s Lagoon Site

The sag pond known as White’s Lagoon should be protected for its natural features. It should also be noted that the lagoon area, particularly to the west, shows the incredible disturbance in the landscape caused by the April 18, 1906 earthquake.

Big Slide and the “Crazy Forest”

The trail that currently drops down from White’s Lagoon to Aptos Creek winds through a hillside that was affected by the April 18, 1906 earthquake. The entire hillside slumped during the earthquake and parts of the lower hillside slid into the creek creating a dam that restricted the flow of Aptos Creek until the following winter rains washed it away.

The interpretive potential in this area is very high. This is a wonderful place to show the impact of the earthquake, the single-age, single-species stands of Douglas fir, and the trees that have corkscrewed in their efforts to become vertical after being thrown out of plumb by the slipping and sliding landscape.

Historic Features - Railroad Cuts, Fills and Trestle Footings

The current Aptos Creek Trail follows, more or less, the standard gauge railroad grade constructed by Chinese crews between 1883 and 1887. Once the trail crosses Aptos Creek, it enters a huge railroad cut before popping out to the location of a huge, double trestle that curved across Aptos Creek at this spot. Other than the cuts themselves, little remains of this

railroad line. Mountain bike activity has altered these landforms and impacted their historic integrity. The site has some interpretive potential.

Historic and Natural Site – Epicenter of Loma Prieta Earthquake, October 17, 1989

From the switchbacks on the present-day Aptos Creek trail to that trail's intersection with the Big Slide Trail, there are numerous fissures and landslide faces that were caused by the huge earthquake. Several huge cracks along the mountainside just downstream from the trail intersection are particularly noteworthy. This is an excellent site to interpret both the 1906 and 1989 earthquakes.

Historic Site - Monte Vista Mill Site Number 2

From 1887 to 1900, the Loma Prieta Lumber Company had a second mill site operating alongside Aptos Creek from which it shipped the milled lumber down to its large lumber yard in Aptos. The mill site is located on the south side of the creek approximately .5 miles downstream from Five Finger Falls. The site has some interpretive potential.

Historic and Natural Site – Five Finger Falls

Once known as Monte Vista Falls, this waterfall was the object of nineteenth century tourists into the Aptos Canyon. The fall is created by a nameless tributary that drops down through a sandstone cut and then over a bench and down into a sandstone bowl beside Aptos Creek. The bowl's faces are covered with maidenhair ferns, giving the falls its present name.

There is also a large amount of standard gauge rail in the creek bed that extends upstream from this location for several hundred yards. The effort and expense made by the Southern Pacific Railroad and its Chinese crews to get to the redwoods that stood upstream from this location has interpretive value.

Historic Site – The Loma Prieta Mill Site and Landslide, April 18, 1906

On April 18, 1906, a huge section of land on the south side of Hinckley Creek broke loose, slid down, and crushed the Loma Prieta lumber camp, killing eight men. Because of the remoteness of the site and the rugged country, the site has never been thoroughly recorded or explored.

Interpretive and Educational Resources

The Recurring Theme – Nature Prevails

Natural forces are erasing the human story in The Forest of Nisene Marks State Park. Each year it is becoming increasingly difficult to see the signs of the industrious and persistent loggers who fought their way into the canyons and harvested the treasures that grew there. And, if there's any one theme that emerges from the history, it is the transitory nature of human activity in the Park. Each time the loggers worked their way into the far reaches of the canyons, natural forces drove them out. Floods and earthquakes, working separately and sometimes together, ultimately humbled the humans. Even recently, first in 1982 and then

again 1989, natural cataclysms drove the public from the Park, causing the Department of Parks and Recreation to reevaluate access and activities. Just as the logging companies found themselves rebuilding sections of their railroad lines each spring, so did the Department have to make annual repairs to the Park's trail system.

The story of human activity in The Forest of Nisene Marks State Park needs to be told as one of inspiration. First as one about the possibilities of achieving goals against insurmountable odds. Only ingenious optimists could imagine laying an incline against the nose of China Ridge and dragging a railroad locomotive to that ridge top. But the listener should also be inspired by the power of the landscape to shrug off the activity and to heal itself. Each year the ripple of old railroad ties is dampened by winter rains, and old bridge footings give out a sigh and finally fall into the creek and out to sea. Humans were here and worked hard to extract a living from the canyons, but the landscape continues to heal. This is powerful yet fragile landscape, and if there is no other lesson to be gained from its history, it is that it demands respect.

The Forest of Nisene Marks State Park is also a monument to the men and women who worked hard to reassemble the parcels, get them into the hands of the State, and then continued to add to the Park over the ensuing 40 years.

Visitor Centers and Interpretive Centers

The Park does not contain a Visitor or Interpretive Center.

Museums and House Museums

The Park does not contain Museums and/or House Museums.

Interpretive Kiosks

A kiosk is located at the entrance to The Forest of Nisene Marks State Park. The kiosk is primarily used as a Ranger Station and fee drop, but often is also used as a form of communication between users of the Park (through pamphlet displays, etc.).

Interpretive Trails, Roads, and other features

Several historic sites within the park are currently designated by explanatory signage. The preferred plan alternative suggests that additional interpretive signage be provided at various other nodes. The Historic Resources section describes various these sites and makes recommendations for interpretation.

Exhibits

There are exhibits at the entrance station area, Porter Picnic Area, Mill Site, Bottom of the Incline, and other areas throughout the Park.

Events and Programs

Lumberjack Day, initiated in 2002, drew large crowds of interested visitors.

Educational Programs

Guided walks, school programs, forest bike rides, and Ranger Explorers are currently coordinated by the Seacliff Visitor Center in cooperation with the South Sector Staff. Walks and other programs are led by park staff and docents.

Aesthetic Resources

Visual Resources and Scenic Characteristics

The existing visual character of the Park is determined by the attributes (color, form, texture) of specific site features and by the patterns that the features have assumed as a result of natural processes and human uses. The assessment of the visual attributes and patterns of the Park's features in this document is organized according to the following general descriptive categories: site location and spatial orientation, landform, surface waters, land uses, and vegetation. The existing visual character of the Park is also influenced by atmospheric effects and by seasonal changes in the foliage of the natural vegetation on the site. The site does not contain specific built objects, such as buildings, that have aesthetic significance.

Site Location, Landform and Spatial Organization

The Park is located on steeply sloping surfaces formed by ancient uplifted marine terraces that are deeply dissected by stream courses located in canyons that traverse the site. The Park can generally be described as steep-walled, forested canyons, generally trending from north to south, that rises to the north to form a ridge. Stream-cut canyons can be described as V-shaped (in profile) that are about 140 to 160 feet deep enclosed by steep slopes that generally range from 30 to 100 percent gradients, but in places vertical cliffs form the canyon walls. The canyon slopes and bottom are heavily forested with redwoods, conifers, oaks, and willows.

The forested and wooded canyons of the Park are visually integral with the larger landscape pattern of rural and agricultural land uses within portions of unincorporated Santa Cruz County. That pattern is broadly defined by the repetition of terraces and canyons aligned almost at right angles to the dominant forms of the ridge crest and shoreline that run roughly west and east. While the landscape is generally forested and natural in character, it is not pristine; man-made features including residential and associated structures, roads, utility lines, and fences are interspersed with stands of trees throughout.

Surface Waters

The Park contains no visually important surface water bodies. Streams occur within steep canyons shrouded by dense vegetation that obstructs views of water features from upland areas.

Land Uses and Cultural Features

The Park is generally undeveloped. Recreational developments, including trails and picnic facilities are visually unobtrusive. The main access road roughly bisects the Park. Overhead utility lines occur in the lower portion of the Park.

Vegetation

The Park is dominated by second growth redwood and coniferous forests that consist of predominately native species. The species composition of the forests results in a visually homogeneous cover for the Park, medium to dark green in color and fine-to-medium in texture. The native evergreen species forests have few seasonal foliage effects and no visually important floral effects. Densely wooded canyon bottoms offer dark shade, lush vegetation, and running water. Many species of wildflowers provide scenes of great beauty during the spring and summer.

Patches of scrub and chaparral and native and non-native grasses occur at scattered locations throughout the Park. Grasslands exhibit seasonal changes in color, from bright green in winter, drying to tawny brown in summer and fall. Although the seasonal change in grassland color is important in establishing the summer pattern distinctive on coastal hills throughout California of light-colored, fine-textured grasslands alternating and contrasting with evergreen woodlands, it contributes only a minor aspect to the Park's visual character.

Negative Visual Features and Characteristics

The visual aspect of the Park is dominated by a forested landscape unimpeded by human-built objects or negative visual features or characteristics.

Viewsheds

Views from within the Park are generally obstructed and restricted by dense forests and topography. Long-range views are available at locations such as the Sand Point Overlook. The views include the forested Park and environs in the foreground, the Pacific Ocean dominating the background, intermixed with developed portions of Aptos, Capitola, and Santa Cruz.

Creeks

Aptos Creek

Aptos Creek meanders through a steep canyon lined with lush ferns and vegetation. Contained within the upper reaches of the creek is Monte Vista Falls, a fifty-foot waterfall and 100 to 150 foot cascade through sandstone. Stumps, debris, and the remains of a standard gauge railroad line are visible reminders of the logging era. The second growth redwood forest masks other remnants for the logging era of the Park. There are currently approximately 20 miles of trail through this area. Devil's Slide, a beautiful cascade, occurs above Monte Vista Falls.

Bridge Creek

Bridge Creek drops rapidly, beginning and ending within the Park and emptying into Aptos Creek. This creek includes a thirty-foot waterfall, Maple Falls, located 0.5 mile above the remains of the Bridge Creek Logging Camp Historic Site.

Hinckley Creek

Steep and windy, Hinckley Creek has its origin in the Park near Santa Rosalia Ridge and flows westward eventually discharging into Soquel Creek approximately 0.5 mile outside of the Park. The majority of the creek is inaccessible and therefore mostly unused by Park visitors.

Overlooks

Sand Point Overlook

Named by the loggers around the turn of the century, this vista point, at an elevation of approximately 1600 feet, affords a magnificent view of the Bridge Creek Basin area directly below and out into Monterey Bay. Views from New Brighton State Beach to Lighthouse Point State Park can be seen on a clear day.

West Ridge Trail Overlook

This area along the upper portion of the West Ridge Trail, offers an excellent view of the Bridge Creek Canyon looking south and east. Monterey Bay can also be seen from Sunset State Beach to well below Moss Landing.

Santa Rosalia Ridge Overlook

This area, approximately 2,500 feet in elevation, looks south over Park chaparral, the Aptos Creek watershed and Monterey Bay.

China Ridge Overlook

This vista looks west over the Bridge Creek Canyon and Lower Aptos Creek Basin, and is located on Aptos Creek Road above Donkey Engine Flat at the top of the incline.

Virgin Redwood Groves

Van Eck Tree

A virgin redwood tree approximately 200 feet tall and about 12 feet in diameter, the Van Eck Tree is located along Aptos Creek Road approximately 0.5 mile north of the Town of Aptos. The tree and surrounding area was donated to the Park in 1971 by Mrs. Agnes Mangels Van Eck and is estimated to be from 1,500 to 2,000 years old.

Hinckley Basin Virgin Redwoods

There are approximately a dozen virgin redwoods located sporadically throughout the Hinckley Basin in areas nearly inaccessible to Park visitors. No trails lead to this area.

Cusack's Meadow Virgin Redwood Grove

Approximately six trees make up this grove located approximately 0.25 mile downhill from Cusack's Meadow.

Hollow Tree

Hollow Tree is located approximately two miles above Sand Point Overlook on the Santa Rosalia Ridge. This tree has been topped by wind or lightning and partially hollowed out by fire. Another virgin redwood is located about 60 feet to the east.

Out House Tree

A virgin redwood about fourteen feet in diameter that has been burnt and broken is located southeast of White's Lagoon toward Aptos Creek near the location of an old logging cabin. During the logging era, this tree was used as an outhouse. No improved trails occur in these areas.

Cusack's Meadow Virgin Redwood Grove

Approximately six trees make up this grove located approximately 0.25 mile downhill from Cusack's Meadow.

Designated Scenic Areas or Routes

No officially designated scenic areas or routes occur within close proximity to the Park.

External Views

The Forest of Nisene Marks State Park is visible from many short-range, medium-range, and long-range³⁶ vantage points. The Park appears as a natural, pristine landscape in views from all vantage points.

³⁶ Generally, short-range views are those in which the field of view extends ¼ to ½ mile from the viewer; objects are seen in the foreground, affording clear, detailed images in which fine differences in color, texture, and form can be discriminated (Sheppard, 1989). Medium-range, or middleground, views extend from ½ to as much as 5 miles from the viewer, depending upon landscape type (flat or irregular terrain, forest or low-growing vegetative cover). Medium-range views are characterized by loss of fine details and softening of contrasts in the image, although colors, coarser textures, and large features of individual landscape elements remain perceptible. Long-range, or background, views extend from the middleground to infinity.

Recreational Resources

Recreation Activities

Regional Recreation Use

Countywide, regional parks and open space comprise 12 State Parks as well as open-space lands administered by the County and City of Santa Cruz and by non-profit organizations such as the Sempervirens Fund and the Land Trust of Santa Cruz County. The Land Trust of Santa Cruz County, for example, administers nine properties for their conservation and open space values, and Santa Cruz County manages 850 acres of parks. The county's 29 miles of coastline, beach access, and a total of 42,334 acres of public open space are a significant recreational resource (Santa Cruz County Department of Economic Development, 1999).

Recreational Uses of the Park

The Park is well used by runners, hikers, and mountain bikers year-round and these three uses clearly account for most Park visits. Other Park uses include picnicking, horseback riding, swimming, fishing, and passive recreation such as nature study and quiet reflection.

Recreation Facilities

Backpackers Camp

West Ridge trail camp includes six campsites and a pit toilet. There are no water sources and only backpacking stoves are allowed. Parking is available at West Ridge Trailhead or George's Picnic Area. Overnight camping requires advance reservation and is only allowed at the West Ridge Trail Camp. There is a fee for overnight camping.

Picnic Areas

There are three picnic areas available in the Park all of which are located along Aptos Creek Road. They are furnished with tables, barbecue grills, and restroom facilities.

Emmett Reed Picnic Area

Located near the Entrance Station this picnic area includes three picnic tables, and two raised barbecue grills. There are restrooms located in close proximity and available parking is located in a gravel lot.

George's Picnic Area

This picnic area is located 1 mile from the entrance station on Aptos Creek Road, and includes four picnic tables, raised barbecue grills and a restroom. There is a pay telephone located across the nearby bridge over Aptos Creek.

Mary Easton Picnic Area

Comprised of seven picnic sites including tables and raised barbecue grills, this site is located 1.5 miles from the entrance station in a grove of redwood trees. The area was named for Mary Easton, the wife of Warren Porter, secretary of the Loma Prieta Lumber Company and later Lieutenant Governor of the State of California.

Porter Family Picnic Area

The Porter Family Picnic Area is located 2.2 miles from the entrance station and contains three picnic tables and barbecue grills. This site was named for the Porter family who played an important role in the lumber company and its operation. During 1901-1904 the current parking area was the site of Shillings Camp. The camp consisted of cabins for workers, a barn to store hay and bed down the mules, a blacksmith and cookhouse.

Existing Trails

The Park offers approximately 40 miles of multi-use and single-use trails, 30 miles of which are regularly maintained. Many trails follow the original railroad grades built between 1882 and 1922. Bicycles are restricted to paved/fire roads and other designated trails, hiking is allowed on all trails, and dogs must be leashed at all times. The most heavily used trails are described below.

West Ridge Trail

West Ridge Trail is approximately six miles long, beginning at Aptos Creek Road, gaining elevation to the ridge, traveling along the ridge, and finally descending into West Ridge Trail Camp. It is open for hiking only.

Aptos Creek Trail

Aptos Creek Trail is slightly less than four miles long and is restricted to hiking. The trail leaves Aptos Creek to climb to Emerald Pond where it intersects with the big slide, dropping to Aptos Creek again. Five Finger Falls is a tributary of Aptos Creek.

Patterns and Levels of Use

The Park is well used by runners, hikers, and mountain bikers year-round and these three uses clearly account for most Park visits. Other Park uses include picnicking, horseback riding, swimming, fishing, and passive recreation. During the summer and fall of 2001, a volunteer for the park planning effort conducted 79 two-hour sampling sessions at the Entrance Station (Kiosk), George's and Porter Family Picnic Areas, Vienna Woods, Terrace Trails, and Sand Point Overlook. As per this survey, by far the most intense use originates in the lower part of the Park: only 2 percent of the visits³⁷, were recorded at Sand Point Overlook. Of the use occurring in the Park below the Loma Prieta Mill Site, runners, hikers and bikers were 25, 52,

³⁷ Defined as a single visitor counted during a single sampling period.

and 23 percent of the total, respectively. The only other uses stated (swimming and horseback riding) were less than 1 percent of the total.

The 77 percent of the use represented by foot travel (hiking and running) are uses which are consistent with the Park's purpose and mission, and which reflect the desires of the 70 percent of Californians who prefer natural and undeveloped and nature-oriented parks (California Department of Parks and Recreation, 1998). Hiking is usually informal and in very small groups. Some hikers, and especially runners, can be somewhat more organized: for example, the Santa Cruz Track Club, a non-profit organization established in 1989 to promote running and track and field, sponsors weekly long-distance runs in the Park, and the Sierra Club organizes hikes two to three times a year with groups of 25-30.

Mountain biking had its origins in 1981 when a Bay Area firm introduced the first mass-produced mountain bike. The sport has become widely popular as Americans have sought more demanding forms of physical exercise and for the simpler reason that the bikes are comfortable, durable, versatile and fun (Marin Municipal Water District, 1994). Since the existing conditions for mountain biking are a more recent phenomenon for the Park (Bloom, 1995), they are discussed in more detail below.

The Park as a whole has a regional reputation as a mountain biking destination. By far the most common reference in the biking literature is to the 18-mile "out-and-back" Aptos Creek Fire Road, from the Park Entrance to Sand Point Overlook (considered one of the best relatively easy trails in the area), and to the Hinckley Basin and Buzzard Lagoon Fire Roads. Generally, paved and unpaved³⁸ Park roads are open to bicycles. Trails which are not designated "multi-use" are closed to bicycles. Besides the fire roads, bicycles are allowed on four of the seven named trails below the Steel Bridge, which are in the multi-use category.

Recreational fishing in Aptos Creek is permitted from the mouth up to the Steel Bridge. The fishing season runs November 16-February 28, but only on Saturday, Sunday, Wednesday, legal holidays and opening and closing days. Only barbless hooks may be used and no fish may be kept.

Recreation Potential

Recreation potential for the Park is related to desired future conditions and facilities. Refer to the Plan section of the document for data pertaining to recreation potential.

Existing Parking

The primary entrance to The Forest of Nisene Marks State Park is located 7 miles from the city of Santa Cruz, off Highway 1, on Aptos Creek Road in Aptos Village. The current parking facilities are limited. There are several small lots within the Park, one at the entrance station, and the other just north of the Steel Bridge. The majority of Park users park in the dirt lot (private property) located before the main entrance to the Park. Most other entrances to the Park do not have parking lots attached, and parking occurs in pullouts along the roadway,

³⁸ Unpaved park roads are defined as fire roads, dirt roads, and service roads with a width of over 60 inches.

or on city streets and existing public parking lots in the nearby vicinity. There are less than fifty existing parking spaces located in the defined area of the Park.

General Accessibility

Visitors have access to areas of the Park along the Aptos Creek Fire Road. Most of the Park lies behind the two road gates that are in place to limit vehicular traffic. The upper gate is locked year round and the lower gate is locked during the winter season. Pedestrians and cyclists are able to gain access around gates when they are locked through areas between the gateposts and the hillside. The upper gate has an area on each side of the gate that pedestrians and cyclists can pass through that are 31 and 45 inches wide. The lower gate has only one side opening that is 25 inches wide. While it is necessary to limit vehicular traffic during the winter season, if the clearance between the gate and the hillside was wider it would allow wheelchair users access similarly to other pedestrians and cyclists.

Picnic Areas

There are four designated picnic areas: Emmett Reed, George's, Mary Easton, and the Porter Family picnic areas.

Emmett Reed Picnic Area

This picnic area is located near the Entrance Station. Available parking is located in a gravel lot. There are three tables and two grills. Tables are designed to provide wheelchair access on either end. Grills are fixed to provide the cooking surface within the acceptable height for providing accessibility.

George's Picnic Area

George's Picnic Area is located below the Steel Bridge providing year round access via the road. There are five tables and four grills. Paths providing access to these tables from the parking area have sections of grades and cross slopes that range from 10 to 18 percent in 5-foot sections. Tables are not designed to meet accessibility recommendations. Grills are fixed to provide the cooking surface within the acceptable height for providing accessibility.

Mary Easton Picnic Area

Located just north of the Steel Bridge, the Mary Easton Picnic Area includes seven tables and grills. Tables are not designed to meet accessibility recommendations. Grills are fixed to provide the cooking surface within the acceptable height for providing accessibility.

Porter Family Picnic Area

This picnic area is located beyond the Mary Easton Picnic Area and 2 miles north of the entrance kiosk. The picnic area is below the parking area with access provided by a trail that has a section of 26 percent grade for 75 feet. The trail narrows to 31 inches minimum clearance width. There are three tables and two grills. The tables are not designed to meet

accessibility recommendations. Grills are fixed to provide the cooking surface within the acceptable height for accessibility.

Toilet Facilities

There is a pit toilet located at each of the picnic areas and also at the West Ridge Trail Camp. Toilets at the Entrance Station and Emmett Reed Picnic Area would meet accessibility recommendations with some minor modifications.

Parking

Parking areas within the park are either gravel or soil. There are no parking areas that have defined spaces within these parking areas. No spaces are designated as being accessible.

Trails

Trails within the Park are classified using the California Department of Parks and Recreation classification system. Trails are rated based upon criteria that have been determined by the agency, such as use patterns, dimensions, proximity to other facilities, types of trail users allowed, or interpretive. All trails within The Forest of Nisene Marks State Park have been classified into one of three categories.

Class 1 trails may include accessible, equestrian, interpretive, or hiking trails. These trails are typically considered higher use trails or easier to access by visitors because of their location to other park amenities.

Class 2 trails are typically further away from developed visitor areas.

Class 3 trails are more remote to developed visitor areas and are used infrequently.

Class 1 Trails

There are three trails at The Forest of Nisene Marks State Park that are considered to be Class 1 Trails. These include the Buggy Trail, the Porter Trail, and Split Stuff Trail.

Buggy Trail

Park visitors throughout the year can access the Buggy Trail, as the trailheads are located below the Winter Gate near George's Picnic Area and also at Aptos Creek Road. The Buggy Trail is about 0.4 miles (2,383 feet) in length.

Porter Trail

Park visitors can access the Porter Trail only when the Winter Gate is unlocked. The Porter Trail can be accessed from the Porter Family Picnic Area and also off of Aptos Creek Fire Road. The Porter Trail is about 0.8 miles (4,172 feet) in length.

Split Stuff Trail

Park visitors throughout the year can access the Split Stuff Trail, as the trailhead is located below the Winter Gate near Emmett Reed Picnic Area. The Split Stuff Trail is about 0.1 miles (735 feet) in length.

Class 2 Trails

There are ten trails at The Forest of Nisene Marks State Park that have been classified as Class 2 trails. These include Bridge Creek, Loma Prieta Grade, Mill Pond, Oak Ridge, Old Growth Loop, Rancho Aptos, Terrace Trail, Trout Gulch, Vienna Woods, and West Ridge.

Class 3 Trails

There are six trails within The Forest of Nisene Marks State Park that have been classified as Class 3 trails. These include Big Slide, Big Stump Gap, Cusacks, Five Finger Falls, Maple Falls, and Upper Aptos Creek.

Circulation

Roadway Network

Regional Roadway Network

Regional access to the project vicinity is provided by State Route (SR) 1, SR 9, SR 17 and SR 35. SR 1 serves as the primary north-south access route along the California coast. In the project vicinity, SR 1 is a four-lane freeway, providing connection to the City of Santa Cruz and points northwest, and Watsonville and points to the southeast. SR 9 is a two-lane highway extending northwest from SR 17 in Santa Cruz, terminating at SR 35 near the Santa Cruz/Santa Clara/San Mateo County junction. SR 17 is the primary access route between the Santa Cruz and Santa Clara Counties. Within Santa Cruz County, SR 17 ranges between a four-lane expressway and freeway. SR 35 is a two-lane highway that extends northwest from SR 17 between Santa Cruz and Santa Clara Counties, continuing into San Mateo County.

Local Roadway Network

There are currently north and south public vehicular access points into the project site. From SR 1, the Park is reached via the State Park Drive exit, and then east on Soquel Drive to Aptos Creek Road, and hence north to the Park south entrance; or alternately, via the Rio Del Mar Boulevard exit, and then west on Soquel Drive to Aptos Creek Road, and hence north to the Park south entrance. From SR 17, the northern Park entrance is reached via east on Summit Road and Highland Way, and south on Buzzard Lagoon Road to the Park north entrance. The *1994 General Plan and Local Coastal Program for the County of Santa Cruz* classifies State Park Drive, Rio Del Mar Boulevard, Soquel Drive as arterials. Moreover, the County's general plan designates these arterials, as well as Summit Road and Highland Way as part of the Master Plan of County Bikeways system.

Traffic Volumes

Table 7 presents existing available daily traffic volumes on regional and local roadways affected by the project. Weekday traffic within the project vicinity consists primarily of commute traffic within the peak traffic periods (typically 7:00 to 9:00 a.m., and 4:00 to 6:00 p.m.), with residential and commercial-associated traffic occurring throughout the day.

Utilities

Wastewater

The Forest of Nisene Marks State Park has no wastewater or sewer system. There are, currently, four pit toilets available for public use.

Water Supply

The Forest of Nisene Marks State Park has no potable water available for public use.

Electricity

The Forest of Nisene Marks State Park has no facilities that utilize electricity. There are no electrical outlets or sources available for public use within the Park.

Public Services

Police Services

The California Department of Parks and Recreation and Santa Cruz County Sheriff's Office provide crime protection and prevention services for the Park.

Fire Protection Services

The California Department of Forestry provides fire protection services for the Park from the Soquel Demonstration Forest. Current response time to the Park is generally immediate, depending on specific location within the Park. The California Department of Forestry engine companies include both two-wheel-drive and four-wheel-drive vehicles in addition to air support.

Fire Hazard Potential

Brush species, particularly chaparral, are extremely combustible, while grass, woodland, and forest vegetation do not pose as great a hazard. Steep slopes (greater than 30 percent) are also less accessible to firefighters. The region's climate also contributes to wildfire hazard. The entire Park may be considered a high fire hazard area during the summer and early fall when local vegetation loses moisture content and high southwesterly winds are common. Particularly dangerous conditions may exist when winds sweep up the canyons.

Park Support

The Forest of Nisene Marks State Park is part of the South Sector of the Santa Cruz District. State Park Rangers assist in the supervision of the Park, are responsible for handling safety and health issues, and act as visitor aids.

The Forest of Nisene Marks State Park has an extensive trail system that has been maintained in the past by The Advocates for Nisene Marks, Trailworkers.com, and Mountain Bikers of Santa Cruz. Volunteers from these groups as well as daily park users have helped to keep the Park staff informed of human disturbances within the Park.

The Forest of Nisene Marks State Park is open from sunrise to sunset every day of the year. An entrance station is located at the parking lot for the Emmett Reed Picnic Area. Backpack camping in the Park is first come, first served, and camping reservation are made by contacting the Park directly.

Planning Influences

General Plan Designation

The Santa Cruz County General Plan land use designation for the entire Park is listed as “Existing Parks and Recreation.” This designation is intended for land that is used for recreational purposes. This general plan would be consistent with the current Existing Parks and Recreation County General Plan designation.

Deed Restrictions

The bulk of The Forest of Nisene Marks State Park was granted to the State by the Marks family via a series of deeds between 1963 and 1965. Lands deeded with restrictions include the Arden Forest (750 acres), Timothy Hopkins (1,700 acres), Aptos Forest (4,800 acres) and the Hinckley Basin (2,500 acres). The deeds have similar language.

All of the deeds state the intention of preserving these lands as a “natural preserve” with the end that “its citizens may enjoy this land in perpetuity.”

The deeds stipulate that lands were conveyed to create a State Park to be named “The Forest of Nisene Marks,” that adequate standards for public health and safety shall be maintained, and that there shall be no horseback riding.

In addition, the deeds for the Aptos Forest and Hinckley Basin specify that the “property shall be held in its natural state, except that such trails, water drinking facilities and sanitary facilities as shall be necessary for the convenience of the public, and shall be in keeping with their natural surroundings, may be constructed on the property.”

The Arden Forest and Timothy Hopkins deeds specify that the “use of the property shall be limited to camping, nature study, hiking, and associated activities. Any development of the property in connection with said activities shall be in keeping with its natural surroundings.”

These deed restrictions are a planning influence on all property above the Soquel Augmentation Line. However, the language in the deeds is subject to interpretation. Some believe that the restrictions prohibit certain uses (namely, mountain biking) while others argue that, with the exception of horseback riding, a reasonable interpretation of the language does not restrict such uses.

For the purposes of this planning document it has been determined that:

The term “natural preserve” is meant in a generic sense. That is, that the property should receive a high level of resource protection, that the natural surroundings should be preserved, and public use limited to activities such as camping, nature study, hiking, and associated activities. It does not incorporate the definition of “natural preserve” as specified in the Public Resources Code (Section 5019.71), which was not adopted until 1978, some thirteen years after the deeds were recorded.

The appropriateness of multiple uses (shared use), has been reviewed in light of the Department's legal authority and the conditions of the gift of the property. It has been determined that, except for equestrian activity on trails, other forms of uses, including mountain biking, are not inconsistent with those conditions.

System-wide Planning

The Department performs some planning that addresses issues that cross-park and regional boundaries. Any system-wide plans developed in the future that contain specific recommendations pertaining to the use, operation, or management of the State Park may also effect future planning decisions at The Forest of Nisene Marks State Park. The following are existing statewide or system-wide planning influences that may affect planning decisions at The Forest of Nisene Marks.

- Public Resources Code (PRC)
- California Code of Regulations
- California Environmental Quality Act
- Policies, Rules, Regulations, and Orders of the California State Park and Recreation Commission and California Department of Parks and Recreation
- California Department of Parks and Recreation Operation Manual (DOM)
- California Department of Parks and Recreation Administration Manual (DAM)
- California State Park System Plan
- California State Park Mission Statement
- California State Parks Access to Parks Guidelines
- Resource Management Directives for the California Department of Parks and Recreation. These directives amplify the legal codes contained in the PRC, the California Code of Regulations, and the California State Park and Recreation Commission's Statements of Policy and Rules of Order. The following Directives are pertinent to existing or potential issues at The Forest of Nisene Marks State Park:

- #5 State Park Development
- #26 Consideration of Ecological Factors
- #28 Visitor Use Impacts

- #29 Vegetation Management
- #34 Exotic Plant Elimination
- #35 Wildlife Habitat
- #36 Wildlife Population Balance
- #37 Erosion Control
- #43 Water Quality Control
- #46 Environmental Quality
- #63 Cultural Resource Management Plan
- #74 Recreation Development/Use

Regional Planning

Consideration of regional context is important in any discussion about the land use and facilities at The Forest of Nisene Marks State Park. The Park is located in the Santa Cruz Mountain Range in close proximity to state and county parks and beaches, as well as open space preserves. When planning for The Forest of Nisene Marks State Park, it is important to understand the intrinsic values within the Park as well as the relationship with the surrounding greenbelts and recreational corridors.

The result of its diverse landscape has made The Forest of Nisene Marks State Park a popular destination spot for those seeking a variety of recreational experiences. The Park's character and land uses maintain a low level of development that remains in keeping with the regional surroundings. The range of facilities and recreational opportunities provided regionally complements those available at The Forest of Nisene Marks State Park. Recognition by planners of regional diversity is of the utmost importance in managing for natural processes and providing for quality recreational opportunities.

The following describes the current public lands management agencies and land uses surrounding The Forest of Nisene Marks State Park.

Regional Plans and Policies

AMBAG Regional Population and Employment Forecasts

The Association of Monterey Bay Area Governments (AMBAG) is the Federally-designated Metropolitan Planning Organization for the Monterey Bay region, which consists of Monterey, San Benito, and Santa Cruz Counties. Among AMBAG's responsibilities are the preparation of regional population and employment forecasts for use by other agencies in the Regional Air Quality Management Plan, the Regional Transportation Plan, and the Regional Water Quality Plan.

Based on AMBAG's 1997 forecasts, the entire Monterey Bay region is expected to grow to a population of 920,908 people by 2020 (from 64,282 people in 1995). This projection represents an increase of 42.3 percent over 1995 figures. The City of Santa Cruz is expected to grow to population of 64,386 by 2020 according to AMBAG, an increase of 22.5 percent over the 1995 population of 52,555. The proposed General Plan would add no new residents to the site and is consistent with AMBAG's population and employment forecasts.

Air Quality Management Plan

The park is located in the North Central Coast Air Basin, under the jurisdiction of the Monterey Bay Unified Air Pollution Control District (MBUAPCD). The purpose of the MBUAPCD's 1994 Air Quality Management Plan is to establish a comprehensive program that will result in the achievement of Federal and state air quality standards. Individual AQMP's from all California air quality districts are incorporated into a State Implementation Plan, which outlines the state's effort to comply with the Federal Clean Air Act Amendments. Project consistency with the AQMP is determined by AMBAG. For a more detailed discussion of the AQMP and cumulative air quality impacts, refer to the Air Quality section.

Regional Water Quality Plan

The Water Quality Control Plan for the Central Coast Basin (Basin Plan) was developed by the California Regional Water Quality Control Board, Central Coast Region. The Basin Plan is intended to show how the quality of the surface and ground waters in the Central Coast Region should be managed to provide the highest water quality reasonably possible. Specifically, the Basin Plan lists the various water uses in the Region; describes the water quality that must be maintained to allow those uses; and describes the programs, projects, and other actions that are necessary to achieve the standards established in the plan.

The Basin Plan implements a number of state and federal laws, the most important of which are the California Porter-Cologne Water Quality Control Act and the Federal Clean Water Act. The U.S. EPA has delegated responsibility for implementation of portions of the Clean Water Act to the State and Regional Boards, including water quality planning and control board programs, such as the National Pollutant Discharge Elimination System (NPDES).

The proposed General Plan would comply with all state and federal regulations governing water quality. Given the expected compliance with applicable standards and regulations, together with the setbacks the project would provide from creeks, the proposed General Plan would be consistent with the Basin Plan.

Congestion Management Program

The Congestion Management Program (CMP) was enacted by the State Legislature in order to address traffic congestion in California's urbanized counties. The Legislature noted that the existing transportation system relied upon an overcrowded street and highway system that impacted the economic vitality of the state and diminished the quality of life in many communities.

By statute, the CMP has seven elements: 1) designation of a system of highways and roadways with minimum level of service (LOS) performance standards; 2) development of a uniform transportation database for use in a countywide traffic model and for evaluating the transportation impacts of development proposals; 3) designation of a transit network with frequency, routing, and coordination measures; 4) a trip reduction and travel demand management element promoting alternative transportation methods; 5) a land use impact analysis program; 6) a seven-year capital improvement program; and 7) a biennial review of the jurisdiction's conformance with LOS standards, travel demand management requirements, and land use impact analyses.

Local jurisdictions are responsible for assessing the impacts of new development on the CMP highway system when preparing project EIRs and for selecting appropriate measures to mitigate such impacts from a “toolbox” of strategies. According to the Santa Cruz County CMP, Highway 1 is the only CMP roadway in the vicinity of the Park. The proposed project would not in itself significantly affect levels of service along Highway 1.

Zone of Primary Interest

The Department’s concern for any environmental changes or ongoing impacts outside the unit that could jeopardize or degrade State Park System values are thought of as zone(s) of primary interest.

At The Forest of Nisene Marks State Park, the Department is concerned with the following: forest management; utility power lines; residential developments that fragment important bio-corridors within the unit’s watersheds; the potential for water contamination of streams originating on lands outside of park boundaries; off-highway vehicle trespass from roadways or neighboring lands; lands that may ultimately connect the park to other open space or that may help provide for additional public parking and access.

Discussion and all other comments regarding land acquisition are intended for long-range planning purposes only, and do not represent any intent or commitment for acquisition. Acquisition of any land depends on many factors, including the availability of funds and the willingness of the owner to sell. In most areas, through proper enforcement of existing county planning and zoning regulations, private lands can be privately managed in harmony with the neighboring State Park lands.

Public Participation

A multi-disciplinary team prepared this general plan with assistance and guidance from the California State Parks Department, Santa Cruz District. The information in the plan was gained through a process of research, and through the distribution and compilation of public surveys and meetings. Specific information was gathered for all areas, but specifically, vegetation, wildlife, the Park’s history, and the desires and use patterns of visitors.

Contact with various advocate groups for the park took place throughout the general plan process. These groups include, but are not limited to, The Advocates for Nisene Marks, Coast Redwood Institute, Mountain Bikers of Santa Cruz, Nisene 2 Sea, and the California Native Plant Society. Students from Cabrillo College conducted an informal survey of visitor use patterns, while visitor needs and concerns were surveyed through a questionnaire.

Public meetings were held in Soquel and Aptos during three stages of the process: (1) Presentation of the Park and General Plan and identification of issues the General Plan should address; (2) Alternatives for each General Plan issue; (3) Presentation of the preferred plan. Several newsletters were mailed to over 500 people over the course of the process. The newsletters informed the public about the planning process, where to obtain information, surveyed and summarized public comment, served as a notice of upcoming public meetings, identified where the team was in the process, and explained and clarified the major issues and

proposals of the General Plan. Planning information was also made available via the State Parks website.

Issues/Analysis

Natural Resources

Increased awareness of the diversity and fragility of sensitive plant and animal species, as well as their supporting habitats has created greater need to protect and interpret these resources. Further guidance to direct resource management and conservation efforts at the Park is needed to ensure the perpetuation of these values for future generations.

Biocorridors

In some cases, portions of remaining, viable habitat linkages are privately owned and unprotected. Development of these private parcels will jeopardize the wildlife movement through these corridors. Management goals and guidelines should be coordinated between the Park and adjacent government owned properties to ensure the future of biocorridor habitats. The identification and management of areas containing representative, sensitive, or otherwise important habitats within the Park and the biocorridors that link these habitats to those outside of the Park are essential to the maintenance of the Park and regional ecosystems.

Historic Resources

Information acquired through the generation of this General Plan has confirmed the existence of archeological, and cultural resources. Most of these resources are associated with the logging era of the park. Greater protection and interpretation of these historic resources is needed in order to preserve California's heritage and for the education and enjoyment of Park visitors.

Aesthetic Resources

Aesthetic qualities of the Park can be adversely impacted by man-made intrusions such as developments, activities, or land uses that are incompatible with the Park's natural character. Increasing development and more intensive land uses surrounding the Park place increase emphasis on protecting scenic features and preserving the visitor's experience of the Park's aesthetic qualities.

Recreational Uses

The Forest of Nisene Marks State Park is a place where visitors can appreciate undeveloped scenic open spaces, and diverse, abundant wildlife and vegetation while recreating on an extensive trail system. The existing multi-use and single-track trails system, and fire road, provide opportunities for a spectrum of activities, both active and passive. Recreational uses will satisfy both user needs and resource protection requirements, and for the most part, be compatible with visitor experiences.

Access and Parking

Public vehicle access is limited to the Aptos Creek Road main entrance. The location makes it difficult to access the Park and causes off-site parking conflicts. The existing parking area is not a State owned or designated parking lot, and current property owners have proposed development which would eliminate the ability of visitors to park at this site. Furthermore, the access into the Park from this point is a narrow, dirt road. Upgrade of the road is difficult because a section of the road is private property.

The other entrances into the Park have limited parking (spaces are parallel to roadways), and are restricted to pedestrian and bicycle access. There are no developed parking, restroom, or trash facilities at these locations.

The Plan

The purpose of The Plan is to portray the desired resource conditions of the Park and desired visitor experience, and to provide goals and guidelines that will direct future management efforts toward achieving those desires. The Plan section, however, does not designate detailed facilities with specific size, design, and locations. During the expected life of this general plan, it is recognized that new technologies, different recreational needs, and new opportunities cannot be foreseen with the writing of this document. Therefore, different methods can be used in the future to achieve the desired conditions within the parameters provided by this general plan.

The Plan section includes the Declaration of Purpose and Unit Vision, which set the purpose for park management and the image(s) of what it could ultimately be like in the future. This section includes a discussion of carrying capacity and allowable use intensities designated for specific areas of the Park. A further discussion of Resource Management Zones is also provided, including their significant values and constraints, management approaches, and management objectives. Unitwide area goals and guidelines are prescribed which state the management intentions and provides general guidance supportive of the Park's natural, cultural, scenic, and recreational resources. Collectively, the contents of The Plan section will provide the direction for the future management, development, and use of The Forest of Nisene Marks State Park.

Unit Purpose and Vision

Resource Values

The Forest of Nisene Marks State Park continues to recover from its history of logging. Despite the impact of earthquakes, landslides, and humans, the Park remains natural and relatively wild. Protection and preservation is necessary for the continuation of the Park's current state, and the enjoyment of visitors. Most importantly, these acts will ensure that the Park maintains its characteristic uniqueness.

In order for the Department to recognize increased visitation and future needs, management actions will be created for compatibility between visitor impacts and the protection of natural and cultural resources. In achieving this, The Forest of Nisene Marks State Park will be a natural setting that provides for a range of recreational activities.

Achieving compatibility between Park uses and protection is the result of public appreciation of the Park's inherent resources. Interpretation of cultural and natural resources will motivate the acts of preservation and protection. Appropriate public facilities will, whenever possible, be incorporated with the setting, remaining unobtrusive, low impact, and respectful of the scenic characteristics and resource values of the Park and surrounding area.

Collaboration with agencies, groups, and individuals will provide a growing body of information of the resources within the Park and beyond Park boundaries. This working relationship will also create another avenue for public education and responsibility.

Declaration of Purpose

The Declaration of Purpose is the “mission statement” for each unit of the State Park system. It is the general guiding statement that provides direction for the development of the General Plan. The Declaration of Purpose for The Forest of Nisene Marks State Park is:

The purpose of The Forest of Nisene Marks State Park is to preserve and protect the natural and cultural resources, wildland values, and supporting ecosystems of the upper watershed of Aptos Creek and adjacent areas of the Park, while providing opportunities for the visiting public to enjoy, experience, and be inspired by the unique and diverse topography, geology, biotic communities, and scenic views.

Unit Vision

The Forest of Nisene Marks State Park will retain its rugged character and spectacular natural beauty. The redwood forests will continue their recovery and the upper watersheds will preserve their sense of solitude and remoteness. Historic sites within the Park will be protected and interpreted.

Visitors will access The Forest of Nisene Marks State Park from several points around the perimeter of the Park. The lower portion will continue to receive the most use and will have the greatest urban interface. Access in this portion of the Park will accommodate several modes of transportation - vehicle, bike, equestrian and foot traffic. Adequate parking will be provided within Nisene Marks to accommodate normal usage.

The entrance to the Park will be well signed and landscaped to create an appropriate sense of entering a special place. Families arriving by vehicle will be directed to a visitor/education center close to the entrance. Here they will have an opportunity to orient themselves to the Park and discover its distinctive natural and cultural resources. Those wishing to experience these resources may avail themselves to several looping, passive use trails emanating from this facility that immediately immerse them in the special qualities of the Park. Outreach efforts will bring school children to the education center and onto suitable trails. Opportunities for partnerships, joint interpretation, and research will be encouraged with the Monterey Bay National Marine Sanctuary, the Soquel Demonstration State Forest, and others.

Where feasible, trails and parking for disabled access will be developed. Trails will be designed to move bikes through this heavily used lower area and into other suitable areas of the Park that are less frequented by foot traffic. Longer looping trails as well as fire roads will accommodate more active forms of recreation. Equestrian use will be accommodated in the lower area of the Park. Access to vista points and other points of interest will be maintained. Interpretive nodes will be established at significant points of interest.

The upper portion of The Forest of Nisene Marks State Park will be designated as a low use area. Sensitive plant and animal communities and habitats will be protected, as well as the sense of remoteness and solitude unique to the Santa Cruz Mountains. Protection of the upper reaches of the Aptos and Hinckley watersheds will remain a priority. The proposed Sand Point Trail Camp and the fire roads will accommodate shared use, with the exception of

equestrians, in order to maintain connections with the Soquel Demonstration State Forest. Biological corridors will be maintained and enhanced, as will regional trail connections. Opportunity purchases of appropriate lands will enhance these regional connections, as well as reduce in-holdings and provide additional access points.

General Unit Management Goals and Guidelines

Unit Classification

Classification establishes broad management guidelines and direction for public use. It provides certain resource protections under the California Public Resources Code (PRC 5019.50), California Parks and Recreation Commission policies, and resource management directives of the Department. The Forest of Nisene Marks State Park was classified and named by the State Park and Recreation Commission in 1962. This “state park” designation remains appropriate for balancing current and future needs.

State Park land contains outstanding natural, scenic, or cultural values of statewide significance. Improvements can be undertaken for the purpose of making areas available for public enjoyment in a manner consistent with the preservation of natural, scenic, cultural, and ecological values for present and future generations.

Each State Park shall be managed as a composite whole in order to restore, protect, and maintain its native environmental complexes to the extent compatible with the primary purpose for which the Park was established.

Resource Management Zones

In this general plan, areas known as Resource Management Zones (RMZs) were established after evaluating the natural, cultural, and recreational features. These zones are not land-use designations but strategies that steer the development of resource management objectives and guidelines for the designated area.

The Forest of Nisene Marks State Park has been divided into three primary resource zones (Figure 8, Preferred Plan, Alternative B). The plan recognizes that the lower portion of the Park (from the Park entrance off Soquel Drive to the Porter Family Picnic Area) is the most heavily used zone. Consequently the plan recommends that the land be managed for resource protection and more intensive recreation use. The middle zone (the Bridge Creek drainage) is designated for resource protection and moderate recreation. And finally, the upper portion of the Aptos and Hinckley Creek watersheds will be managed primarily for resource protection while accommodating compatible recreational opportunities.

Resources in the State Park System are generally managed under one of the following four approaches:

Natural Resource Management: This type of management views natural systems as a complex set of processes and interactions. If impacts have been made upon these resources, this management philosophy would attempt to restore the natural state of the systems to a self-maintaining level.

Cultural Area Management: Cultural management is used in areas of significant historical or archeological character. Therefore the utmost consideration is given to the preservation and interpretation of cultural features.

Recreation Enhancement: This type of management requires creative approaches for enhancing visitor appreciation of natural and cultural resources. While resources may be managed through knowledge/information, the underlying factor would be to provide safe usage by the public.

Special Protection: Management for a specific element or condition is often recommended by legislation earmarking acquisition funding, by unit classification, by declaration of purpose, as well as by federal, state and local laws. Rare habitat management and scenic viewshed protection are a few examples of special protection.

The RMZ's mapped for The Forest of Nisene Marks State Park appear in each of the three alternative maps. They were delineated after an analysis of the natural conditions, cultural features, and current and desired future human use patterns for each of the watersheds. Essentially, the upper reaches of the Park will be managed primarily to maintain the health of the Aptos and Hinkley Watersheds and the remote character of the land. The potential increase in visitation and future recreation demands will be met primarily in the lower portions of the unit.

Resource Management Goals and Guidelines

Presented below are general goals and guidelines that are unitwide in their application. Goals are broad statements of desired outcomes – for example, maintain ecosystem health and productivity, or promote community stability. Guidelines provide more specific direction for achieving the goal, or describe the desired physical, natural, cultural resources, or social conditions to be met – for example, land, health, or water quality standards. The Goals and Guidelines for the Park are defined and expressed below:

Natural Resources

A Resource Management Plan is needed to provide a management program for the natural elements and processes of The Forest of Nisene Marks State Park. The Plan would include an inventory of natural and cultural resources, identify sensitive areas that may preclude or limit recreational uses, develop programs for resource stabilization and enhancement, and identify standards for ongoing management of sensitive areas.

Goal: Prepare a Resource Management Plan for The Forest of Nisene Marks State Park.

Guideline:

- The Resource Management Plan should specifically address management of natural and cultural resources, including sensitive areas that may preclude or limit recreational uses.

Biocorridors

Protecting biocorridors and facilitating the continued movement of animals and dispersal of plant seed within The Forest of Nisene Marks State Park, and between the Park and other wildland areas, is imperative to maintaining the health of the ecosystem and regional conservation.

Goal: Maintain and enhance the movement of native animals through the Park to the regional ecosystem.

Guidelines:

- Biocorridors should be addressed in the Resource Management Plan for The Forest of Nisene Marks State Park. Biocorridors will be recognized when there is enough information to indicate the importance or necessity of these connections to the exchange of plants and animals between The Forest of Nisene Marks State Park and other wildland areas. The adequacy and effectiveness of these habitat linkages should be monitored by documentation of the presence, distribution, movement, and habitat associations of the representative species using them.
- The collection of baseline information and the monitoring of the health and function of core areas and biocorridors should be included in the Park's Resource Management Plan. An emphasis should be placed on measuring the effects of human uses on the integrity of the system.
- The Department, along with federal, state and local jurisdictions and councils, regulatory agencies, and private landowners, should work together to insure that preserves and interconnecting biocorridors are effectively managed at a regional level.

Special Status Species

Special status species include species of plants and animals formally protected by federal or state regulation in addition to species in decline on a regional or local basis. Protecting special status species and their supporting habitats within The Forest of Nisene Marks State Park is imperative to sustaining the species and maintaining ecosystem health.

Goal: Maintain, protect, and/or improve habitat for special status species.

Guidelines:

- All known or potential habitats for sensitive, rare, threatened or endangered species will be evaluated. Consultations with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) in accordance with the federal Endangered Species Act, and with the California Department of Fish and Game (CDFG) will be conducted when appropriate.

- Protection or enhancement of riparian areas will be part of the planning and development considerations.

Watershed Function

Manage the Park to protect and restore natural watershed function and remedy sediment and other soil stability problems. Overall, the geologic formations of the Park have a relatively high (for coastal California) inherent stability. Nevertheless, soils with high erosion potential coupled with recreation and other land uses have the potential to destabilize watersheds.

Goal: Manage the Park to protect and restore natural watershed functions.

Guidelines:

- Watershed function should be restored and human-caused soil erosion and stream sedimentation problems addressed as resources permit. The Department should cooperate with other landowners and regulatory agencies to address watershed issues affecting the Park. A watershed management plan should be prepared and implemented for specific management actions needed to achieve watershed management goals.
- Standards for siting, constructing, upgrading, maintaining, and decommissioning roads and trails shall be based on best management practices from all available sources (e.g. Weaver and Hagans Handbook for Forest and Ranch Roads, 1994).
- Protect natural wetlands within the Park from fill and from effects of recreational and operational activities. Wetlands comprise areas that meet the definition used by the U.S. Army Corps of Engineers.

Zone of Primary Interest

Human-caused disturbances on properties adjacent to The Forest of Nisene Marks State Park can have detrimental effects on Park resources and disrupt natural ecosystem processes. Possible impacts include exotic plant infestations, chemical pollution, predation and competition from domestic pets, wildfire, artificial light and noise, and loss of foraging or nest habitat. Activities such as logging, residential or commercial development, land clearing, and road building can result in increased sedimentation of Park streams.

Goal: Mitigate or prevent outside disturbances from having adverse impacts on Park resources and disruption of natural ecosystem processes.

Guideline:

- The Department should continue to work with local jurisdictions, appropriate organizations, and adjacent property owners to ensure long-term protection of park resources and ecosystems. The Department should review and comment on projects proposed on lands adjacent to the Park if they could have a direct and immediate detrimental effect on Park lands.

Vegetation Management

Plant communities at The Forest of Nisene Marks State Park have been impacted since the mid-19th century by logging, residential and agricultural development, and alteration of the fire regime. These impacts have caused a shift in species composition, changes in the structure of plant communities, and a change in the pattern of communities at a landscape level. The past management practices have changed the ecological conditions under which native plant communities flourish, altering the dynamics of the system and reducing wildlife values.

Goal: Restore, protect, and maintain native ecosystems and indigenous flora and fauna through active resource management programs. Preserve and perpetuate examples of natural plant communities.

Guidelines:

- The Department will identify the total framework of environmental and ecological factors influencing the Park, including those arising from human activities, and to promulgate and apply resource management techniques required to negate deleterious human influences, and to achieve the environmental objectives established by the Plan.
- Vegetation management will be directed toward establishing the natural ecological processes that are essential for the development of native plant communities, expansion of these native communities, and the removal or reduction of exotic plant taxa. This restoration should occur with a minimum disruption to natural processes.
- Management action will minimize and, where possible, prohibit activities that further the spread of non-native plants.
- The Department should develop and implement a long-term program to control and/or eradicate exotic plants to prevent the establishment and spread of non-native species that could displace native species and disrupt natural communities. Priority for control efforts should be given to those species most invasive and conspicuous within the Park.
- Non-native animal species will be discouraged through appropriate habitat management and when necessary by direct control measures. Currently wild pigs occur throughout the Park and regularly damage areas of native vegetation, making these areas more susceptible to erosion and invasion by exotic plant species. Other non-native animals may be identified as threats to managed lands, and these will be evaluated on a case-by-case basis.
- All riparian areas within the Park shall be considered important biological and aesthetic resources, and shall receive a high priority for restoration and a high level of protection from disturbance.

Native Plant Communities

The Forest of Nisene Marks State Park supports a number of important native plant communities such as the Purple Needlegrass Grassland, Red Alder and Red Willow Riparian, Cattail Series, and the Woollyleaf Manzanita Series. These plant communities are essential habitat for both rare and locally important wildlife species and communities.

Goal: Preserve and protect sensitive native plant communities and the natural processes that ensure their perpetuation.

Guidelines:

- Restore native plant communities where feasible.
- All seedlings and saplings used in habitat restoration projects will originate from seed collected from native plant taxa within Park boundaries or from a nearby area.

Special Plants and Communities

Special plants are listed annually on the California Department of Fish and Game's Special Plants List. A subset of this list includes those species listed by the U.S. Fish and Wildlife Service, the California Department of Fish and Game, and the California Native Plant Society as rare, threatened, or endangered. Species that are proposed for listing by the federal and state governments are legally protected as if they were listed, and species listed by CNPS on their lists 1A and 1B meet the criteria for listing and are protected as such. Other species locally sensitive and important to the management of park units are also considered special by the Department.

Special plant communities include those either determined to be rare by the California Department of Fish and Game Natural Diversity Data Base, are of local significance, or provide critical habitat for State and/or Federal listed wildlife species.

Goal: Protect special plants and special plant communities within The Forest of Nisene Marks State Park and manage for their sustenance in accordance with state law (PRC, Division 2, Chapter 10, Section 1900).

Guideline:

- In conjunction with any site-specific planning and development, heavy use activities, or prescribed burns, affected areas shall be surveyed³⁹ for the presence of State or Federally listed plants or plant communities, and operations with impacts which cannot be successfully mitigated will be avoided.

³⁹ Surveys will follow "Guidelines for Conducting Research on Rare, Threatened and Endangered Plants and Plant Communities (California Department of Fish and Game, August 1997)."

Exotic Plants

Exotic plants are located throughout The Forest of Nisene Marks State Park and therefore are a concern to native plant species. Exotic plants often displace natives, detracting from the natural appearance of the unit.

Goal: Prevent the establishment and spread of exotic plant species in the Park.

Guideline:

- A long-term program of control and/or eradication measures is necessary to prevent the establishment and spread of non-native species that could displace native species and disrupt natural communities. Priority for control efforts should be given to those species most invasive and conspicuous in the Park.

Wildlife Management

The protection and perpetuation of native wildlife populations will be accomplished, in part, through restoration and enhancement of native plant communities, management of exotic plant taxa, and perpetuation of aquatic habitats within the context of a Vegetation Management Plan.

Goal: Protect, perpetuate, and restore native wildlife populations and native aquatic species at The Forest of Nisene Marks State Park.

Guidelines:

- All sensitive wildlife species and their habitats will be protected. Include all taxa that are locally important (including endemic species), whether or not they appear on any endangerment list, as well as those protected by Federal and/or State law. Management and protection of sensitive species is dependent upon adequate maps and other data regarding species presence within, movement through, and uses of the Park.
- Specific management programs should be developed as necessary to protect and restore sensitive animal populations and their habitats using sound ecological principles and professionally accepted methods. If it is necessary to regulate animal populations, the methods used will be based on sound principles of ecosystem management, will be consistent with Department Resource Management Directives, and will avoid disturbance to other natural values of the Park.
- Prior to any site development, heavy use activity, or prescribed burn, surveys for sensitive wildlife should be conducted during the appropriate season for detection in areas that will be affected. Programs or projects to be undertaken should be designed and scheduled so that sensitive wildlife and their requisite habitat will not be adversely affected.
- Development should be located and designed to protect and enhance enjoyment of the primary resources. The primary purpose for development is to place visitors in an

optimal relationship with the resources, for recreational enjoyment and understanding of those resources.

- Maintain the natural wildlife habitat of the Park wherever possible.
- All streams with the potential to support salmonids should be managed in a manner that allows sufficient water flow and water quality to support migration, spawning and rearing of steelhead and coho salmon. This standard may be met by pursuing modifications in land use practices and specific improvements in habitat quality through projects undertaken as part of the Plan.
- All stream channels should be protected from human-induced erosion and contamination.
- All streams within the Park that support salmonids shall be periodically surveyed to assess the quality of spawning and rearing habitat. Site-specific plans to enhance riparian and in-stream conditions will be prepared and implemented as necessary.
- The Department shall balance recreation and access with protection of resources, favoring low-impact activities in areas with high wildlife use.
- Domestic dogs accompanying visitors to the Park will be controlled in accordance with the Department's rules and regulations.

Cultural Resources

Historic Resources

The Forest of Nisene Marks State Park includes a number of significant historic resources, including buildings and structures, features, and cultural landscapes. A townsite, millsite, cabins, and logging camps from the late 1800s and early 1900s have been located in the Park and recorded. In addition, railroad grades and cuts mark the landscape of the Park.

Goal: Identify and protect all significant cultural sites and features in The Forest of Nisene Marks State Park.

Guidelines:

- Measures should be taken to identify and protect all significant cultural historic sites and features. Historic resources will be preserved and protected through implementation of Department and professional standards.
- The Park will be managed for the protection of cultural resources. More specifically, cultural resources shall be protected against damaging or degrading influences, including deterioration or adverse modification of their environments.
- Prehistoric archaeological sites located within the Park should be identified, evaluated, protected, preserved, and interpreted where possible.

Aesthetic Resources

Scenic Preservation

The diverse landscape of this region offers visitors a variety of scenic experiences, from expansive views of the California coastline and Santa Cruz Mountains, to intimate views of redwood forests and secluded grasslands. Impacts to aesthetic qualities are, at times, created by developments, activities, or land uses, within or outside the Park, that are incompatible with these qualities.

Goal: Protect scenic features from man-made intrusions and preserve the visitor's experience of the natural landscape by minimizing adverse impacts to aesthetic resources.

Guideline:

- Park facilities should visually integrate into the environment through the use of appropriate siting techniques, scale, materials, and colors. The Department should work with adjoining jurisdictions regarding land use and development within the viewshed of the unit that may affect the Park and its scenic resources.

Visitor Use and Development

Recreational Uses

The Forest of Nisene Marks State Park is a place where visitors can appreciate undeveloped scenic open spaces; enjoy diverse, abundant wildlife and vegetation; and recreate on an expansive trail system.

Goal: Provide for appropriate, sustainable visitor uses of the Park while at the same time protecting resources.

Guidelines:

- Recreational uses will satisfy both user needs and resource protection requirements, and for the most part, be compatible with other visitor experiences. Recreational uses will generally occur where manageable with existing Park staff or volunteers and where there is adequate, safe access to the recreation activity areas.
- Recreational facilities shall be operated to enable the public to see, enjoy, and understand the primary resources of the Park.
- Special emphasis will be placed on resolution of unauthorized uses of the Park. Increased coordination will be made with local, State and other Federal law enforcement agencies.

- The planning and design of new facilities will consider capacity and use intensity so that significant ecological damage or deterioration will be prevented.
- Accessibility improvements, utilizing Access to Park Guidelines should be considered for all facility improvements.

Access and Trails

The Forest of Nisene Marks State Park has multiple access points located at the various roadside parking areas, or trailheads designated at the Park's perimeter. The intensity of use on trails varies with the destination of visitors and their purpose for long or shorter hikes or bike rides, or for access to Park features.

The existing trail system is the primary recreation facility and means for visitors to experience undeveloped areas of the Park. Trails should be well planned and maintained. The corridor shown in the preferred plan alternative is not drawn to scale and is only meant to be representative. Since Park fire roads are not considered paved roads, the corridor is necessary to allow access through the Park. If necessary, the corridor may be widened or narrowed at specific locations.

Goal: Provide appropriate access and opportunities for the visiting public to enjoy the Park, while not degrading the natural/cultural features and ecological processes.

Guidelines:

- A Unit Trails Plan should be prepared that strives to create opportunities for visitors to enjoy the unique and diverse topography, geology, biotic communities, and scenic views at The Forest of Nisene Marks State Park. The actual location, distance, and use of future trails should be governed by this plan.
- Trailhead connections and signing for interpretive information and visitor safety should be improved throughout the Park and at main points of entry.
- A loop-trail system should be designated to distribute people throughout the Park and encourage use of perimeter parking locations, and to facilitate a balance of trail use that is commensurate with resource values.
- Trails should provide for public access within the Park and to adjacent regional trail systems, with priority for achieving unitwide resource management goals and objectives. The Department should support regional trail objectives, coordinate with other land management agencies in the Santa Cruz Mountains vicinity to evaluate and monitor resource conditions, and share information to develop open space management programs and multiple use trail plans on a regional scale.
- Future trails planning and construction should include the Department's specifications and policies concerning trail construction and maintenance, and be coordinated with soil erosion and sediment studies.

- All possible opportunities for trail accessibility will be examined and given a high priority.

Visitor Use Impacts

It is recognized that any recreational use produces at least some impact, and that the Department needs to manage visitor impacts. Also recognized is the importance of providing and maintaining diversity in resource features and conditions of the Park. In accordance with the California Environmental Quality Act (CEQA), prior to site-specific development or preparation of management plans, the area of potential impact will be surveyed and reviewed by appropriate personnel and responsible agencies. Should conditions warrant, studies would be implemented to provide further assessment of conditions and monitoring would be initiated to compare changes. It is the goal of the Department to apply, where feasible and necessary, processes and methods of visitor impact analysis to minimize resource impacts and maintain appropriate types and levels of visitor use within this unit.

Unitwide Collections

The Department acquires and maintains collections for several reasons. First, to preserve elements of the natural and cultural environment original to the Park; second, to document the people, events, and cultural or natural features that are central to the Park's purpose; and third, to support the interpretation of themes that are important to the Park. The collection of both natural and cultural artifacts at The Forest of Nisene Marks State Park will be considered only as they fulfill these criteria. Therefore, collections obtained or housed at The Forest of Nisene Marks State Park will be obtained and maintained as directed by Departmental Collections Management Standards outlined in the Department Operations Manual (DOM).

- Natural history specimens will be preserved when necessary to document the natural history of the Park.
- Architectural elements and other materials original to the Park or used in its historic structures will be preserved when necessary to document the history of the Park and its historic structures.
- The Department will establish safe and secure spaces for storage and display of Park collections. Policies and procedures for management of collections as outlined in the Department Operations Manual (DOM) Chapter 20.

Scope of Collections Statement

In the future, museum collections will play an important role at The Forest of Nisene Marks State Park. At present some copies of historic photos of the area are kept at the Seacliff Visitor Center. A small collection of historic items from the logging era is held by the Aptos Chamber of Commerce. This collection and other collections may be acquired when necessary to:

- Retain elements of the real property such as archeological and paleontological materials removed from the site.

- Retrieve objects which were used historically at the site such as lumbering tools, railroad artifacts, or other historic items.
- Document the Park's natural history.

Guidelines:

- The Scope of Collections Statement will be updated as necessary.
- Museum collections will be managed in accordance with the policies and procedures outlined in Department Operations Manual (DOM) Chapter 2000 Museum Collections Management.

Unitwide Visitor Use and Opportunities

Unitwide Interpretation

Interpretation is based on the premise that knowledge deepens the park experience and provides lasting benefits not only to individuals but also to society in general. The following describes the interpretive goals for the Park and its natural and cultural resources, establishes a period for interpreting the Park's cultural resources, and presents the major interpretive themes created to help communicate resource information to the public. If this approach is successful, individuals will have an enriched park experience and, at the same time, help preserve and protect the varied resources found in The Forest of Nisene Marks State Park.

Goal: Provide opportunities to increase the visitors' knowledge and appreciation of the significant natural, cultural, and recreational resources of The Forest of Nisene Marks State Park.

Interpretive Period

The Forest of Nisene Marks was heavily logged from 1883 until 1923. As a result the forest was cleared of the old growth redwoods. During the logging period a railroad and the town of Loma Prieta supported the logging business. The cultural history of this time period is rich with human stories.

In the 1960s the Nisene Marks' family, together with the Nature Conservancy and the California Department of Parks and Recreation, collaborated to create the State's first large second growth redwood park.

In 1989 The Forest of Nisene Marks State Park was the epicenter of the Loma Prieta earthquake, a major tremor that shook the entire Bay Area affecting the lives of the many people who call this area home. The quake brought many visitors to the Park who hiked the trail to glimpse the epicenter.

Guidelines:

- The primary period for the interpretation of the Park's cultural history will be 1883 to 1923. The history of logging in the Park during this time is a powerful human use story.
- Two additional time events are important to the interpretation of the Park's cultural history. In the 1960s The Forest of Nisene Marks State Park became the State's first large second growth redwood park. In 1989 the epicenter of the 7.1 magnitude Loma Prieta earthquake was located in the Park.

Interpretive Themes

Interpretation relies on themes to describe the significant natural and cultural resources of the Park in personally meaningful ways. Themes help connect the various pieces of the Park so that relationships between plants, animals, topography, climate, geology and other parts and forces can be better understood. Most importantly thematic interpretation helps the park visitor understand the role humans have played and continue to play in impacting these resources. The unifying theme and the primary themes are given below. Secondary themes that deal with specific natural and cultural features of the Park, as well as specific locations, will be presented in the Interpretive Plan.

Park Unifying Theme

An ever changing, ever healing landscape where natural and human forces converge

To the casual eye the Park appears to be a wondrous old redwood forest tucked into the soft folds of the Santa Cruz Mountains. However the ferns, moss and stately groves mute the cataclysmic and violent history. Place names such as Big Stump, The Incline, and Loma Prieta Townsite remind us of the huge logging operations while names like The Epicenter, Hell's Gate, and Big Slide provide a clue to the Park's convulsive natural history.

Primary Themes

A rugged, almost inaccessible landscape

The land was folded, twisted, and elevated by the geological faults running deep beneath the earth's surface. Steep, swiftly flowing streams then cut irregular paths through the earth. The result is steep canyon walls, ridge-top crevices, escarpments and barren cliff faces. These forces continue to shape the land's surface with periodic earthquakes uplifting the land, and winter freshets cutting ever deeper.

A diversity of landscape, plant, and animal communities

The sudden elevation changes and twisted canyon faces create a landscape that quickly changes from deep, cool stands of redwoods to semi-arid slopes covered with drought-resistant chaparral.

A delayed human history

From the earliest Ohlone Indians, humans found these canyons formidable and forbidding. The Ohlone ventured into the canyons to harvest seasonal resources such as tanoak acorns but they chose not to live in these canyons. Early European colonists avoided these steep-sided canyons and it was not until the 1880s that capital and technology forced their way into these watersheds to extract the forest treasure that grew there.

The most powerful of forces converged here

California's most powerful corporation, the Southern Pacific Railroad, brought its human and technical forces to bear on this redwood forest. The company literally moved mountains to access the redwood, carving huge cuts and building massive trestles to straighten out the canyons and bring out the wood. But the land did not yield its treasure without a struggle. Winter storms often stopped the company in its tracks, and in 1906, like a dog shrugging a flea off its hide, the earth shook and tossed the Southern Pacific out on its ear.

A humanized landscape

Despite the difficulty of access, ranchers, loggers, oil drillers, developers, firefighters, and Park visitors have left their imprints upon the land. Even the farthest and most inaccessible nooks and crannies were changed by human uses. But time and vegetation have muted those imprints and ultimately the landscape won out. In the 1960s it was decided to preserve this landscape for all time.

The natural forces prevailed

The landscape eventually prevailed blunting and delaying the forces of development and allowing time for the people of California to acquire and preserve the property as a State Park. The story the land can teach us is one of hope and optimism. The land can and will heal and it is wondrous to watch.

The landscape continues to remind us

In the forty years since the Park was created, the natural forces continue to nudge human activity of the landscape. The flood of January 1982 closed the Park for over a year and when it reopened there was less public auto access than before. The Loma Prieta Earthquake of October 1989 also closed large sections of the Park. Each winter trails slip away. Each spring they need to be rebuilt. Human presence in this landscape always was and always will be tenuous and tentative.

Interpretive Facilities and Programs

The interpretive facilities, programs, and media that will convey this information are described in the following guidelines. These guidelines are presented for application of the unitwide goals and interpretive themes presented in the previous section. More comprehensive guidelines and descriptions of interpretive facilities and programs will be included in the upcoming Interpretive Prospectus.

Goals:

- To acquaint the public with the Park's rich cultural history and the natural resources found in The Forest of Nisene Marks State Park.
- To inspire the public to protect and preserve the Park resources.
- To acquire land near the entrance to the Park for a visitor center if there is a willing seller.
- To create additional outdoor exhibit panels within the Park.

Interpretive Panels

Interpretive panels are located at the Emmett Reed Picnic Area, Loma Prieta Mill Site, the Bottom of the Incline, and the Porter House site.

Interpretive panels are needed at the following locations:

- Hoffman's Historic Site - This is the site of the logging camp that was used from 1918 to 1923 and has the remains of several cabins.
- Loma Prieta Town Site - The town of Loma Prieta was located near the mill and at one time was home of 300 people.
- Sand Point Overlook - Map to describe the panoramic view.
- Top of the Incline - This site could be reviewed for a panel.
- Bridge Creek – Historic information.
- Hinckley Basin – Mill site history.
- Walk In Camp – Camping and history information.
- Entrances - Park history, Marks family, logging era information.

Programs

School programs, guided walks, forest bike rides and Ranger Explorers are currently offered at The Forest of Nisene Marks State Park. These programs are coordinated by the Seacliff Visitor Center in cooperation with the South Sector staff and are led by Park staff and docents. These programs should be expanded to encourage use of the Park by a diverse audience. Introducing a variety of guided walk topics and interpretive opportunities can serve to attract groups with diverse interests.

Possible future programs could include docents serving as roving interpreters, docents hosting an interpretive station, and docents offering a weekend booth with hands on activities and

information. Special events focusing on living history, geology, or other topics could attract visitors to interpretive activities. Park staff should encourage minority and urban communities to participate in school programs and public programs. A variety of programs could be offered to Park visitors including nature walks, history programs and forest bike rides. School group programs would be offered on the rich natural and cultural history of the Park.

Carrying Capacity

Public Resources Code Sections 5001.96 and 5019.5 state that the land carrying capacity shall be determined before any park development plan is made, and that attendance at State Park System units shall be held within the limits established by this capacity. A definition of carrying capacity by the code, however, is not provided.

The carrying capacity of land is determined by evaluating the interaction between land uses, and natural systems and how these will affect, over time, the integrity and sustainability of the land. Maximum capacity is the point above which land regeneration is exceeded by demands made on systems and there is a resulting loss. Carrying capacity not only affects the environmental resources of an area but also the quality of the visitor experience. In terms of park and recreation planning, carrying capacity may be extended in meaning to suggest that no cumulative net losses occur in any of the resource values of a unit (natural, cultural, aesthetic, or recreational) due to human use (activities or facility development). However seemingly insignificant, effects have a permanent impact on resource values. Therefore the intent of the Public Resource Code is to avoid degradation of resource-based park systems.

There are a variety of factors involved in the damage of resources creating difficulty in establishing a carrying capacity number. Attendance, individual or group usage, time, and types and patterns of recreational use all contribute to the impact on resource systems. To aid in impact minimization, management can regulate capacity limits, regulate land use, enact mitigation measures, educate and interpret for the public, and ensure proper design. Determination of resource location and significance allows management to create future guidelines for public use and access of a park.

Adaptive management is a tool to address user capacities and is included in this plan. Adaptive management is an ongoing, iterative process of determining desired conditions, selecting and monitoring indicators and standards that reflect these desired conditions, and taking management action when the desired conditions are not being realized.

The four key elements of adaptive management include: (1) determination of desired conditions; (2) selection of indicators and standards that reflect the desired conditions; (3) monitoring of the indicators and standards; and (4) implementation of management action when the desired conditions are violated or when conditions are deteriorating and preventive measures are available. Together, these elements would help property managers make decisions about visitor use and resource protection.

Adaptive management is a decision-making framework, but does not diminish management's role in decision-making; in fact, management would have to make crucial decisions in determining desired conditions, choosing appropriate management action, and assessing

occasional overlap between protecting park resources and providing for visitor experiences. The following outlines the Adaptive Management Program for the Park.

Desired Conditions

Adaptive management relies on the concept of desired conditions, which are contained in the categories of allowable use intensity and identify how different areas within the Park would be managed. Each category of allowable use intensity prescribes a set of desired resource conditions, desired visitor experiences, and types and levels of uses.

Indicators and Standards

A major premise of adaptive management is that desired conditions, which are qualitative in nature, can be translated into measurable indicators and standards. Indicators and standards reflect desired conditions and enable park management to determine whether or not desired conditions are being realized. “Indicators” which are measurable variables, are determined first; “standards” are the acceptable measurements (i.e., values) for that indicator. Desired conditions for each combination of management emphasis and ecological type would have specific indicators and standards developed. Resource indicators measure impacts to the cultural, biological, and/or physical resources from visitor use. Social indicators measure impacts to the visitor experience caused by interactions with other visitors. Indicators should be specific, objective, reliable, related, responsive, nondestructive, and sensitive to visitor use. Standards should be quantitative, measurable, and feasible.

Monitoring

Detailed monitoring protocols would be developed for each standard to ensure accurate, valid data. Monitoring would begin as soon as a standard is selected and a monitoring protocol is developed.

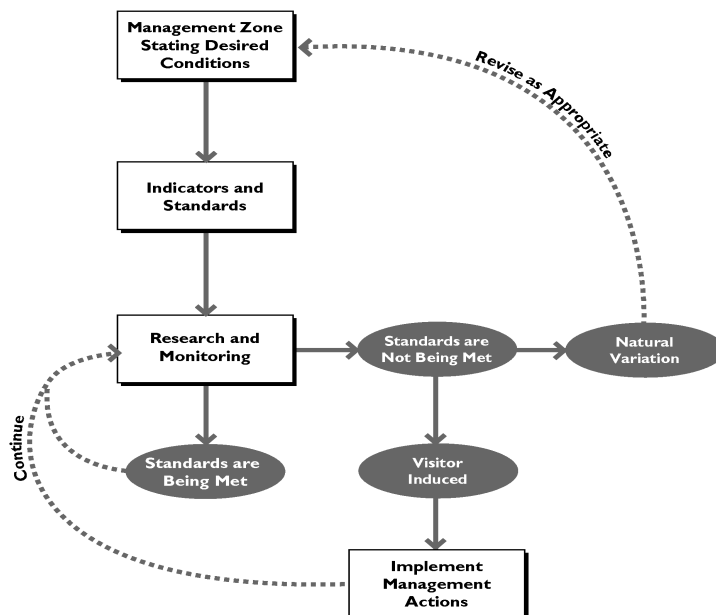
Management Actions

If monitoring revealed that a standard associated with an indicator were being violated, then desired conditions would not be realized and management action would be initiated. Management action could determine that the violation of the standard was caused by natural variation and that the standard needed to be adjusted or a new indicator and standard selected to better reflect desired conditions. Actions to manage or limit visitor use would be implemented when the standard was violated due to impacts associated with visitor use. Management actions could include, but not be limited to, the following:

- Site management (e.g., facility design, barriers, site hardening, area/facility closure, redirection of visitors to suitable sites)
- Regulation (e.g., the number of people, the location or time of visits, permitted activities, or allowable equipment)
- Enforcement of regulations (e.g., patrols, notification, citations)

- Education (e.g., information signs and exhibits, interpretive programs, visitor center exhibits, brochures and fliers, public meetings, meetings with user groups)
- Altering access (e.g., parking in proximity to sensitive resources, bike access, etc.)

Management action would comply with the requirements of the California Environmental Quality Act and other applicable legislation.



Existing Management Actions

There are a number of policies and ongoing management actions that address user capacities and protect the resources of the Park. These policies and management actions would continue and may be modified while the adaptive management program is being implemented.

What the Adaptive Management Program Is Not

It is worth noting what the adaptive management program will not do.

- The adaptive management program does not specify the total number of visitors that the Park, as a whole, can accommodate at one time. Such an aggregate figure would mask problems at “hot spots” and would not provide managers with useful guidance for addressing use-related problems.
- As a framework for addressing carrying capacity, the adaptive management program is not driven by the capacity of existing infrastructure. Expanding or constructing

facilities does not necessarily mitigate visitor use impacts to visitor experience or resources.

- The adaptive management program does not address impacts that do not result directly from visitor use. Impacts from Park operations and management activities (e.g., exotic pest management), natural variability (e.g., flooding), development (e.g., construction, demolition), and other causes not directly associated with visitor activities are managed through other methods.
- The adaptive management program is not static. Visitor use patterns, desired visitor experiences, and resource conditions change with time. The adaptive management program is an iterative process of monitoring, evaluation, and adjustment.

Allowable Use Intensity

Allowable use intensity correlates the significance, sensitivities, and constraints of the unit's resources with an allowable degree of human use. These uses may be defined by human activities and/or development of facilities. Allowable use intensity designations consider past, present, and future uses, and are used as planning tools in assessing the appropriateness of future proposals.

Allowable use intensities are used herein to classify areas and prescribe future desired resource conditions, visitor activities, and facilities. Allowable use intensities provide guidance on how individual areas will be managed. Allowable use intensities are applied to a geographical area for which management directions or prescriptions have been developed to determine what can and cannot occur in terms of resource management, visitor use, access, facilities or development, and operations. Each allowable use intensity has a unique combination of resource and social conditions, and a consistent management prescription. Different actions will be taken in different area with regard to the type and levels of use and facilities.

Allowable use intensities seek to protect and enhance resources of the Park. Allowable use intensities prescribe certain uses and facilities that are not allowed in an area. In the absence of the intensities, additional development and higher-intensity uses could impact resources over the long term. Allowable use intensities also provide opportunities for restoration of resources in areas where lower use and facility levels are prescribed. Allowable use intensities protect the spectrum of recreational opportunities by allowing for visitor access and use of facilities in more resilient locations, and different intensities of use within the Park.

Low Allowable Use Intensity

The areas proposed for low use make up approximately 50 percent of the Park. This includes the upper portions of the Park including the Hinckley Creek watershed and the Aptos Creek watershed just below where Bridge Creek coalesces with Aptos Creek. This area includes sensitive plant and wildlife habitat, unique geologic features, and erodible soils on slopes of 30 percent or more. Specific features included within the proposed low use area include:

- Woollyleaf manzanita series – potential habitat for a number of special status plant species
- Cattail series (e.g., Buzzard Lagoon, White's Lagoon) – potential habitat for California red-legged frog, pond turtle, and several special status plant species
- Five-Finger Falls
- Lompio-Felton complex (5-75% slopes)
- Slopes between 30-50%
- Alquist-Priolo Fault zone
- A majority of the Glenwood Syncline
- The headwaters of Aptos Creek and Hinkley Creek.

The low use area protects the headwaters, including areas of steepest slopes and most erodible soils to ensure long-term management of water quality and habitat for threatened and endangered species such as Coho salmon, steelhead trout, and California red-legged frog. Sensitive resources will be protected through sound resource management efforts, including proper trail construction and interpretation.

This area is designated for low allowable use intensity because they contain important resource values that are especially vulnerable to impacts from activities and development. These areas encompass significant geologic features in pristine and near-pristine conditions and areas with high ecological sensitivities such as rare and endangered flora, rare natural communities, threatened and endangered wildlife and aquatic life, and important habitats for these species. Any allowable uses must be subordinate to the integrity of these resource values.

This area will be managed to preserve and protect sensitive natural resources, including plant and animal species and their supporting habitats, as well as to protect the movement of plants and animals within the Park. Resource protection will be the foremost consideration for all land use and management decisions. This area would be managed with very low tolerance for resource degradation from visitor use, and management action could be taken to change visitor use patterns if such degradation occurred. Visitor experience would be primarily based on hiking, walking, or nature study characterized by light to moderate use focused on marked and maintained trails. There would be some management presence to accommodate resource protection and visitor use. This area would provide substantial opportunities for scientific study of natural processes in undisturbed conditions.

Activities – The following activities would be typical in this zone:

- Hiking
- Swimming and wading

- Fishing⁴⁰
- Photography and nature study
- Interpretive programs

Facilities – The following facilities would be allowed in this zone:

- Marked trails
- Historic features
- Occasional directional and regulatory signs, and safety signs
- Footbridges only at trail crossings where necessary for resource protection and visitor access

The following are examples of facilities that would **not** be allowed in this zone:

- Visitor center
- Operations facilities or storage
- Day-visitor parking

Moderate Allowable Use Intensity

The Park serves as an important recreational resource, providing opportunities for nature study, hiking, biking, picnicking, and other activities for people who visit the Central California coast each year. The Park also serves as a continuous visual element of the landscape.

Moderate Allowable Use Intensity areas are land units managed for resource protection and moderate recreation (these areas may include shared use trails). Ecologically sensitive areas in this category are those with native plant communities that help define the character of the unit, and that provide habitat for native wildlife, and spot locations of sensitive flora and fauna.

Appropriate facilities in the moderate use intensity areas include such uses as trails, roads, primitive trail camps, and small structures for interpretation. Provision for such uses will be designed to avoid or minimize impacts on natural and cultural resources. All other uses and activities compatible with Low Allowable Use Intensity are appropriate here.

Natural resource management in the Moderate Allowable Use Intensity would strive to protect and enhance the natural functioning of ecological and hydrological systems while accommodating moderate levels of visitor use. The Moderate Allowable Use Intensity is designed to protect and enhance biological, hydrologic, geologic, scenic, cultural, and scientific resources, as well as recreational resources. This would be achieved by maintaining, wherever possible, the integrity of an overall ecological unit (such as a native grassland, woodland, or wetland), while allowing for some human alteration of the landscape. Riparian, aquatic, and other native communities play a particularly critical role in a variety of ecosystem processes and are also contributing cultural landscape resources. Restoration of the ecological systems in these areas would focus on enhancing the diversity and stability of natural functions. Resource degradation would be minimized by the careful design and siting of facilities that direct visitor and administrative activities to locations able to withstand heavy

⁴⁰ Fishing is allowed subject to California Department of Fish and Game regulations in all management emphases.

use. Monitoring of visitor impacts on natural and cultural resources would help ensure adaptive and timely management responses to potential resource degradation.

The Moderate Allowable Use Intensity would be managed to protect and enhance resources. Native habitats should remain largely intact, supporting a diversity of native vegetation and wildlife species. However, localized areas could be developed with trails, roads, and parking areas and a greater amount of resource protection features (e.g., fencing and boardwalks) to allow for visitor access. Higher levels of resource impacts (e.g., trampling and soil erosion) and a greater amount of resource protection features might be expected in limited areas within Moderate Allowable Use Intensity to accommodate high numbers of visitors.

The Moderate Allowable Use Intensity emphasis protects resources by directing visitor access to areas able to withstand heavy use. Restoration of natural features, such as wetlands, would also restore the cultural landscape. Interpretation of resources is allowed in these emphases to provide visitor education opportunities.

The Moderate Allowable Use Intensity also protects and enhances recreational resources, which emphasize the value of providing diverse recreational opportunities for visitors. The lower-intensity emphasis provides opportunities for quiet enjoyment of the Park, while the higher use emphasis accommodates higher levels of use at Park destinations.

The Moderate Allowable Use Intensity is intended to be applied to popular areas, where visitors could spend significant periods of time enjoying the Park's resources in a relatively accessible setting. The Moderate Allowable Use Intensity enhances opportunities for visitors to enjoy more intensive recreational activities and could support a range of active recreational opportunities such as picnicking, and bicycling, which would contribute to the diversity of experiences. Visitors would expect moderate to high numbers of encounters with other users and crowding on certain peak days. Large groups could use portions of these areas.

Resource protection activities in this zone would be managed with moderate tolerance for resource degradation from visitor use in specified areas. To protect and enhance cultural, biological, and hydrologic resources, more extensive resource protection measures could be needed to direct visitor use away from sensitive resources. Examples could include boardwalks adjacent to sensitive habitats or fencing to prevent trampling and overuse. By encouraging higher visitor use in the Day Use Emphasis, adjacent and more resource sensitive areas would experience the desired lower visitor use for these areas.

Activities – The following activities would be typical in this zone:

- Hiking and walking
- Photography and nature study
- Picnicking and social gathering
- Bicycling
- Swimming and wading
- Fishing
- Interpretive programs

Facilities – The following facilities would be allowed in this zone:

- Roads and improved trails

- Day-visitor parking
- Turnouts for parking or scenic lookouts
- Bicycle trails
- Marked trails, including bike paths and interpretive trails
- Fences, boardwalks, walls, signs, and other features to direct travel appropriately around sensitive resources
- Interpretive, directional, and safety signs and exhibits
- Utilities such as well sites, utility lines, pump stations and other facilities (where screened from view)
- Bridges where necessary for access, improved circulation, safety, and/or resource protection

The following are examples of facilities that would **not** be allowed in this zone:

- Interpretive centers
- Food services
- Campgrounds and lodging

High Allowable Use Intensity

Lands of higher allowable use intensity are managed for resource protection and more intensive recreation. Ecologically sensitive areas in this category are those with native plant communities that help define the character of the unit, and that provide habitat for native wildlife, and spot locations of sensitive plants and wildlife.

Appropriate facilities in high use intensity areas are trails, roads, bridges, buildings, and other facilities designed to blend esthetically with scenic, natural, and cultural features, and to avoid large-scale disturbance and minimize impacts. Parking availability, group activities, and other compatible land uses identified with Low, and Medium Allowable Use Intensities are appropriate here. Visitors can expect a high incidence of visitor encounters during times of peak-use. Facilities would be easily accessible. High Allowable Use Intensity areas could be accessible by automobile, bus, and by bicycle, with interpretive trails or other marked trails leading to beaches and scenic views. In order to accommodate heavier and more concentrated activity, facilities such as parking areas, restrooms, fencing of sensitive areas, picnic tables, and recycling and trash receptacles would be allowed.

The High Allowable Use Intensity would be characterized by the heaviest visitor use of all areas. Opportunities for solitude would range from low to moderate depending on the season. Social interaction would be common. The High Allowable Use Intensity would be managed with a moderate tolerance for resource degradation due to visitor use. Facilities such as signs and fencing could be used to prevent unacceptable impacts. Facilities would be located away from any sensitive natural or cultural areas, including streams and historic and archeological sites, to minimize impacts.

The High Allowable Use Intensity concentrates visitor facilities in a localized area, allowing for higher protection and enhancement of biological, geologic, hydrologic, cultural, scenic, and scientific resources outside this emphasis. Signs, fencing, and other features could be used to direct visitors away from sensitive biological and cultural resources, as necessary.

Activities – The following activities would be typical in this zone:

- Hiking and walking
- Jogging
- Photography and nature study
- Picnicking and social gathering
- Bicycling
- Swimming and wading
- Fishing
- Interpretive programs

Facilities – The following facilities would be allowed in this zone:

- Roads and trails
- Buildings and other facilities
- Visitor/Education Center
- Parking
- Food storage and campfires, subject to regulation
- Campground
- Compost toilets and toilet enclosures (as necessary to protect resources)
- Marked trails. (Some trails could have remnant paving, soil amendments, or hardened surfaces. Stairs, walls, fencing, and other trail features could be constructed for visitor use management and protection of sensitive areas.)
- Directional, safety, informational, and regulatory signs, and minimal interpretive signs when required for protection of resources
- Utilities associated with facilities

The following are examples of facilities that would **not** be allowed in this zone:

- Campsites outside of designated areas

Area Goals and Guidelines

Presented below are guidelines developed for specific areas and/or resource management zones designated at The Forest of Nisene Marks State Park.

Visitor/Education Center

There are several possible locations for development of a visitor center. They are as follows, listed by preference:

Southwest of the Emmett Reed Picnic Area, this existing undeveloped open space has been the suggested primary location of a prospective education/visitor center. The proximity of this area to the entrance road and existing trail system, and the possibility of incorporating a loop road, separating access of visitors and residents, creates an ideal opportunity for development. Relatively flat, the site would be able to support a large facility and parking lot. The main concern over the development of this site surrounds the proposed parking and roadway. It will be necessary to evaluate the possible impacts on existing resources, assessing the loss of plant life due to roadway and parking design.

The dirt lot at the entrance to the Park, although not Park property, would be the second option for a visitor/education center if there is a willing seller. The benefits of this site are its close proximity to established visitor amenities, the town of Aptos, and the entrance to the Park. Currently, this site is an unofficial and unrecognized Park parking lot. The loss of this space would most likely increase the demand for parking within the Park and at the Park perimeter. As a result, developing a center in this location would require acquisition of the property in the event that there is a willing seller.

A final option for visitor/education center development is a separation of facilities. A visitor center facility might be located in one of the two above-mentioned places, while the education center would be incorporated into the Cabrillo College campus.

Goal: Establish an area as an entrance and visitor/education center for The Forest of Nisene Marks State Park. As such, it will provide for improved vehicle access, parking, orientation, interpretive and educational facilities, and visitor amenities.

Guidelines:

- Development will be guided by the intent to provide a sense of place, consistent with the Park's wildland values. Such development will provide for the restoration and protection of natural and cultural resources and should include interpretation of such values. Development should focus on visitor contact, orientation, and programs for resource education and awareness. Day use parking and visitor facilities shall be provided to support facility needs.
- With the guidance of resource inventories, studies, and review, an overall site plan should be prepared for this area. This site plan should include components for vehicle access, visitor contact, parking and circulation, day use areas, interpretive and operations facilities, cultural protection, buffer zones, and native plant restoration. Site planning should establish a significant buffer between facilities and sensitive resources, consider the separation of day use and administrative areas, and include reforestation (with native species) of open space areas surrounding public use facilities.
- Adequate day use parking should be provided.
- An entrance station or kiosk could be situated at the main entrance road to the visitor/education center and used for Park orientation and visitor information.
- If additional lands suitable for development become available from willing sellers, alternative design solutions could be explored for vehicle access, entrance road, and facility locations.

Picnic Areas

There are four existing picnic areas located in The Forest of Nisene Marks State Park. User surveys suggest visitors would like the addition (at each picnic area) of restrooms, potable water, and a telephone at the most remote site (Porter Family picnic area). In addition to

visitor amenities, each picnic area should be evaluated for adding drinking fountains additional parking, and improved existing parking.

Goal: Improve existing picnic facilities through the addition of user amenities, parking, and the restoration of existing facilities.

Guidelines:

- As funds become available conduct a feasibility study of water versus self-containment facilities for existing picnic areas.
- Evaluate and consider the impacts of improvements on surrounding natural habitats.
- Improve existing sites to allow for various user capabilities.

Trail Camps

The primitive nature of The Forest of Nisene Marks State Park Trail Camp and overall visitor camping experience is being impacted by site location and the condition of the facilities. Trails and road corridors were investigated to determine if other potential trail camp locations existed in the Park. Due to the steep terrain and resource sensitivity, very few sites met the criteria for establishing additional trail camps without causing further resource damage. The area that was identified for a possible trail camp is a site northeast of Sand Point Overlook. This potential site would accommodate the same facilities as the existing trail camp; six campsites, a restroom, and the allowance of backpacking stoves.

Goal: Relocate the existing camping facilities, and restore the primitive camping experience.

Guidelines:

- Remove or relocate existing structures and restore plant and wildlife habitat at the West Ridge Trail Camp.
- The design and location of new campsites should be evaluated to determine impacts to plants and wildlife habitat. Studies will be conducted as funds become available.

Parking and Access

This plan includes parking recommendations to help satisfy operational needs and address resource management and visitor concerns. Current problems for parking and visitor safety relate to the unofficial parking that occurs along the fire/main road of the Park. Parking demand, during peak periods of use, exceeds the current capacity of the main parking lots in The Forest of Nisene Marks State Park. This demand will continue to increase if the unofficial unpaved area adjacent to the Park entry is developed for other purposes. Visitor needs for parking will vary with the type and amount of use desired for a specific area, although parking is desirable at trailheads and primary access locations.

Goal: Satisfy operational needs for improving access and parking for visitors.

Guidelines:

- Retain roadside parking areas where appropriate.
- Parking lots near trailheads and picnic areas should be upgraded with interpretive and information panels, restrooms, potable water, and telephones.
- Provide trailhead and picnic area-parking facilities.
- Provide safe parking areas.
- Provide parking for people with disabilities.
- Provide parking for horse trailers in parking locations below the steel bridge.
- Permit roadside parking in designated, clearly delineated areas only. Control/enforce parking restrictions at Soquel Drive entrance.
- Clearly define where and how people should park within designated areas.

The following are suggested areas for additional/improved parking, although further study is suggested for additional/alternative sites:

Dedication Tree: Add 10-15 parking spaces

Emmett Reed Picnic Area: Add 20-25 parking spaces

George's Picnic Area: Add 12-15 parking spaces

Mary Easton Picnic Area: Add 12-15 parking spaces

West Ridge Trailhead: Add 12-15 parking spaces.

Porter Picnic Area: Add 20-35 parking spaces

Aptos Village Area, if there is a willing seller

Off Highland Way: Add 10-15 parking spaces, if there is a willing seller

Off Olive Springs: Add 20-30 parking spaces, if there is a willing seller

Land Management Zones

The Forest of Nisene Marks State Park serves as an important recreational resource, providing opportunities for nature study, hiking, biking, picnicking, and other activities for people who visit the central California coast each year.

Three levels of land management have been developed based on resource sensitivity and protection, the diversity of recreation opportunities, and visitor use concentration in designated areas of the Park. Each zone prescribes a different management intent for resource protection, visitor use and experience, access, and facility development.

Resource Protection and Low Intensity Recreation

The primary purpose for management in this zone is the protection, preservation, and interpretation of significant resources and management of natural processes. This zone will encompass the northern section of the Park and was defined based on the abundance of sensitive resources occurring in this area. Ridgetops and upper slopes are covered with mixed evergreen forests, chaparral, and oak woodlands. Redwood forests and riparian forests cover the lower slopes and stream bottoms, respectively. Most of the redwoods exhibit second growth characteristics that are approaching a mature forest stage. These varied plant communities furnish valuable wildlife habitat. Riparian communities support potential habitats for the California red-legged frog, and threatened steelhead trout and coho salmon.

Visitor experience and recreation opportunities in this area would be primarily hiking, walking, biking, or nature study characterized by light use on designated and maintained trails. This land management designation would provide substantial opportunities for scientific study of natural processes in undisturbed conditions.

Facilities would be limited and may include designated trails, footbridges at trail crossings where necessary and appropriate for visitor access and resource protection, interpretive facilities, historic features, and minimal signage. The Resource Management Goals and Guidelines are applicable in this zone.

Goal: Establish special protection for sensitive plant and wildlife habitats and geologic features while providing opportunities for low impact and low intensity recreation.

Guidelines:

- This area will be managed to preserve and protect sensitive natural resources and their supporting habitats, as well as protect the movement of plants and animals within the Park.
- As funds become available, undertake studies to define necessary actions for management, preservation, and protection of plant, wildlife habitat, and geologic features.
- Manage the area with a low tolerance for resource degradation from visitor use.
- Recreational activity and development within this zone is limited to trails, primarily for interpretive purposes.
- Locate and design trails to provide access in areas where they would have the least impact on wildlife habitat and ecological systems.

- Future trails development should be guided by a unitwide trails plan and directed by Departmental resource management and interpretive policies, whereby preservation and resource protection are considered the primary management philosophy in this zone.

Resource Protection and Moderate Intensity Recreation

The Resource Protection and Moderate Intensity Recreation zone would be managed to protect sensitive resources, accommodate moderate levels of visitor use, and provide a diverse range of recreational opportunities. Native habitats would be managed to remain intact, while recreation development would occur in localized areas able to withstand higher use levels. This zone would allow enhanced visitor access and accommodate a higher number of visitors than the Resource Protection and Low Intensity Recreation zone.

This designation covers approximately the middle portion of the Park. Two extensions of this zone include shared use roads that travel through the Resource Protection and Low Intensity Recreation zone and provide a connection to the northwestern and northeastern Park access locations.

Activities in this zone may include everything included in the low intensity recreation zone with the addition of trail camping, group activities, picnicking, and interpretive programs. The range of facilities in the moderate intensity recreation zone may consist of trails (including shared use trails), roads, primitive trail camps, parking, and small structures for interpretation. The facilities compatible with low intensity recreation noted above are also appropriate in this zone. The Resource Management Goals and Guidelines and Area Goals and Guidelines for Parking and Access, Historic Features, and Trail Camps are also applicable in this zone.

Goal: Emphasize recreational opportunities for visitors by providing access to diverse recreational resources in appropriate areas while protecting and enhancing the natural functioning of ecological systems.

Guidelines:

- Allow appropriate facility development while maintaining, wherever possible, the integrity of an overall ecological unit (such as a native grassland, woodland, or wetland).
- Provide varied visitor education opportunities through resource interpretation.
- Monitor visitor impacts on natural and cultural resources to ensure adaptive and timely management responses to potential resource degradation.
- Manage areas to allow a moderate tolerance for resource degradation from visitor use.

- Direct visitor use away from sensitive habitats to protect these resources. Use appropriate informational signage, construct boardwalks, and use fencing to prevent vegetation trampling and overuse.
- Screen or soften the visual effect of parking lots from public views.

Resource Protection and More Intensive Recreation

The Resource Protection and More Intensive Recreation zone is characterized by the heaviest visitor use and most accessible and diverse recreation opportunities. It is located at the most southern end of the Park property, at the Park-urban interface. Specific locations of sensitive plants and wildlife, as well as native plant communities and wildlife habitat, are also found in this zone.

Recreation opportunities in this area include those items discussed in the low and moderate recreation zones with the addition of camping facilities and a visitor/educational center. This zone also provides numerous picnic areas with associated facilities, such as parking, water, restrooms, and telephones.

This area of the Park would accommodate more concentrated visitor activity. Social interaction would be common. These intensive recreation areas would be accessible by a variety of transportation options, including automobile, bus, and bicycle. Interpretive trails or other marked trails will lead the visitor to vista points and other destinations throughout the Park. Appropriate facilities in this zone include trails, roads, bridges, parking, utilities, and buildings.

The Resource Management Goals and Guidelines and Area Goals and Guidelines for the Visitor/Education Center, Picnic Areas, Parking and Access, Recreational Uses, and Historic Resources are also applicable.

Goal: Concentrate visitor use, recreation opportunities, facilities, and administrative activities in appropriate locations that will accommodate heavier use, while minimizing impacts to natural, cultural, and scenic resources.

Guidelines:

- Locate facilities away from any sensitive natural or cultural areas, including streams and historic and archeological sites, to minimize impacts to these resources.
- Use signs, fencing, walls, stairs and other features to direct visitors away from sensitive biological and cultural resources, as necessary, and to protect sensitive areas.
- Design facilities to blend esthetically with scenic, natural, and cultural features.
- Utilize sustainable design and materials in the development of new facilities.

Historic Features

These sites represent the historical activities that have affected the Park's landscape. The Loma Prieta Mill Site has foundation timbers that are the remnants of the Loma Prieta Sawmill (1880-1920). Nearby, the town by the same name was established, a cultural and historical focal point of the Park's logging era. Currently, the Loma Prieta Mill Site has interpretive signage describing the significance of the feature.

The top and bottom of the Incline represent the narrow gauge railroad line, built in 1912, that was used to transport "split stuff" from the upper regions of the Park. There is interpretive signage at the bottom of the Incline.

There are numerous other historical and cultural sites in the Park. The significance and completeness of the sites vary, and each needs to be evaluated for interpretive importance.

Goal: Preserve the historic integrity of sites and railroad grades that are determined significant to the history of The Forest of Nisene Marks State Park.

Guidelines:

- Ground-disturbing activities shall be kept to a minimum in the vicinity of designated historic resources without appropriate surveys and possible mitigation.
- If needed and feasible, stabilization of historic sites shall occur in order to preserve their historical integrity.
- Historic sites should be included in the interpretive program, if further research substantiates their historic importance.

Specific Historic Sites:

- Pourroy Historic Site – "Marcel's Forest." The picnic area, barbecue pit and rock walls are historically significant. The Department should make every effort to prevent the further destruction of the barbecue pit. The rock wall should be allowed to stand the test of time and the forces of nature. Also, it is recommended that some kind of low-key interpretation be established in the area to commemorate Mr. Pourroy's legacy.
- Greater Loma Prieta Mill Site and Town Site - The entire area adjacent to the mill and town sites should be recorded as an archaeological site, and efforts made to minimize the impact of Park user activities and maintenance on the site.

Acquisitions

If the opportunity arises to purchase inholdings or adjacent properties from willing sellers, acquisition of the properties should be considered. Park expansion will create buffer zones between the Park and surrounding environments, additional parking options, and provide

connections to adjacent properties, such as the Sequel Demonstration State Forest, allowing increased trail and habitat corridor systems.

Goal: Acquire properties from willing sellers adjacent to and within Park boundaries that are beneficial for increased parking, educational/interpretive centers, trail connections, and habitat corridors.

Guidelines:

- Acquisition of the dirt lot near the Park entry could provide the space for a parking lot, visitor center, and restrooms.
- Acquisition of the privately owned piece of the Park entry road.
- Evaluate adjacent properties to the northeastern portion of the Park for possible connections to Uvas Canyon County Park.
- Evaluate property acquisitions that could allow a connection with Cabrillo College.
- Acquisition of lands off Olive Springs Road, adjacent to Park property, could allow for a parking area of 20-30 spaces.
- Acquisition of lands off Highland Way, which are adjacent to Park property, and which could provide for 10-15 parking spaces.

Issue Resolution

There are a number of issues and planning efforts that require attention beyond the scope of this general plan. Many goals and guidelines of the Plan Section provide direction for each issue. Some of these goals and guidelines recommend future planning efforts such as management plans and studies. The following lists are not intended to be a restriction to working on other issues or lower priority issues or planning efforts.

The Department recommends the following issues be evaluated further and appropriate action is taken to find solutions:

- Park Access Points – Resolve main Park road and boundary access problems through detailed site planning, coordination with local agencies, and facility implementation. Solutions to access problems may require additional property acquisitions.
- Appropriate Recreational Uses – Provide quality recreational activities and public-use facilities without compromising resource integrity.
- Park Accessible Parking – Provide adequate parking at each designated access point, which conforms to various accessibility levels. Solutions to parking problems may require parking plans, and studies, as well as additional property acquisitions.

The general plan recommends that the following planning efforts and studies be undertaken:

- Collection of information and monitoring of the health and function of core areas and biocorridors.
- Management plans, studies, and updates to the Park's Unit Data File as necessary to meet vegetation management guidelines.
- Collection of information regarding sensitive species presence within, movement through, and uses of the Park.
- Management programs to monitor and control non-native pests.
- Regular monitoring of medium and large mammals necessary to gauge the effectiveness of biocorridors and to identify declines or increases in wildlife populations.

Management programs to protect and restore sensitive animal populations and their habitats.

- A trail management plan.

Environmental Analysis

This Draft General Plan, with all its elements, constitutes a programmatic environmental impact report (EIR), as required by Public Resources Code Sections 5002.2 and 21000 et. seq. This EIR is for the approval of The Forest of Nisene Marks State Park General Plan. The discussion of impacts is commensurate with the level of specificity of the General Plan. Site specific development and resource management projects for the Park will be subject to subsequent project-level CEQA compliance and to the permitting requirements and approval of other agencies, such as the Department of Fish and Game, U.S. Fish and Wildlife Service, the State Water Resources Control Board, and others as specific projects are proposed.

This General Plan and EIR constitute the first tier of environmental review. "Tiering" in an EIR prepared as part of a General Plan allows the Department to address broad environmental issues at the general planning stage, followed by more detailed examination of actual development projects (that are consistent with the plan) in subsequent EIRs or negative declarations. Later EIRs may incorporate, by reference, the general discussions from this broader EIR (the General Plan) and concentrate solely on the issues specific to the later projects (Public Resources Code Section 21093: State CEQA Guidelines, CCR Section 15152). This General Plan does not approve or commit the Department to specific projects, sites, or management plans. These items are subject to consideration and approval at a later date by Department management.

Summary

The General Plan, described in The Plan portion of this document, proposes management zoning, unit-wide management goals and guidelines, specific area goals and guidelines, and allowable use intensities. Implementation of the General Plan would apply management zoning to the Park which would provide readily identifiable boundaries for specific types of activities, programs, and developments, reducing the potential for the introduction of inappropriate activities into prime resource areas. Unit-wide and specific area goals and guidelines recommend further data collection, evaluation, and additional specific management planning and resource impact identification prior to new construction or reconstruction. Impacts discussed in this section are related to the proposed management zoning, goals and guidelines, and allowable use intensities. The Plan also includes proposals for the development of specific plans, for example natural and cultural resource management, that would be undertaken prior to development, further reducing the potential for the introduction of inappropriate activities into prime resource areas.

Areas of Known Controversy

Three public meetings were held between January 2001 and May 2002 to solicit public comments on issues. The public voiced opinions and desires regarding the following issues:

- Deed restrictions
- Mixture of natural open space and developed recreational areas
- Facilities

- Recreational uses on trails
- Coordination with other agencies and organizations
- Park use

Information and input from these public meetings was considered in the development of the General Plan.

The Notice of Preparation for the General Plan was circulated to state and local planning agencies on February 26, 2001. Four letters were received in response to the Notice of Preparation. Air quality impacts, evaluations of multi-use trails, resource constraints, alternatives, and types of appropriate visitor use were requested to be discussed in the General Plan.

As a first tier of planning for the Park, this General Plan does not address specific project related comments in detail. Although the Plan sets the overall goals for park management and provisions for public use, it does not define project level development specifics or the methods for attaining resource protection goals. At such time as specific projects or plans are considered for development or adoption these will be part of future planning steps, such as the layout and design of facilities or specific resource management plans and processes.

The objectives of the Environmental Analysis section are to identify, where possible, the potentially significant environmental impacts of implementing the General Plan and to define generalized mitigation criteria and policy-level alternatives. Once the General Plan is approved and adopted, the Department would prepare management and area development plans as required and as staff and funding allow. These would address such issues as vegetation and fire management, and site development plans. The area development plans will provide specific information on resources and design considerations, including layout, facility configuration, capacities, and level of use, within designated areas of the Park.

At each planning level (whether a management plan, an area development plan, or major or minor capital outlay project), the plan or project will be subject to further, more detailed environmental review to determine if it is consistent with the General Plan and to identify any significant environmental impacts and mitigation measures that would be specific to the project. Evaluation generally requires resource specialists to evaluate the scope of work, identify the cause of potential impacts, and specify measures to avoid or reduce the impacts to a less-than-significant level. A detailed environmental review will only be possible at those levels of planning, where facility size, location, and capacity can be explicitly delineated, rather than at the General Plan level.

Summary of Impacts and Mitigation Measures

Implementation of the General Plan would apply management zoning to the Park, subject to further consideration and approval, and proposes the addition of new public use and maintenance facilities and increased public use of the Park. If new public uses and facilities were to be implemented, the increased public access and use, operations, maintenance, and construction activities could result in or contribute to potential impacts. At a program-level, these impacts were found to be at less than significant levels or reduced to a less than significant level with mitigation measures identified in the analysis. As noted above, more

detailed examination of actual development projects (that are consistent with the plan) would be required at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Aesthetics

Implementation of the General Plan could result in aesthetic impacts related to the addition of new facilities, ground disturbance activities, trespassing, and improper use of public access areas, contributing to increased litter, vegetation disturbance, and damage to Park facilities and resources. Potential mitigation measures to reduce significant adverse impacts include implementing design practices, such as road and trail design guidelines, to reduce the negative effect of new roads and trails; installing appropriate screening; restoring disturbed areas; slope contouring; decreasing reflective surfaces; and limiting grading. These mitigation measures would reduce potential aesthetic resource impacts to less than significant at the program-level.

Air Quality

Implementation of the General Plan could result in the construction of new facilities, increasing the potential air quality impacts associated with construction-related emissions from vehicles and equipment, and the generation of dust. Implementation of the Plan could also result in increased vehicle usage within the Park, both from visitation and Park staff, adding to the air quality impacts associated with increased motor vehicle emissions. Potential air quality impacts could also occur as a result of implementing prescribed burns at the Park. Potential mitigation measures include phasing construction projects to minimize surface disturbance, vehicle trips, and the amount of construction equipment; using supplemental exhaust pollution control systems; compliance with fugitive dust abatement measures and use of approved Best Management Practices (BMPs); compliance with applicable Monterey Bay Unified Air Pollution Control District and Monterey Bay Region Air Quality Management Plan governing prescribed burns; emphasizing non-vehicular public access via connections to pedestrian trails, bicycle trails, and public transit; and coordination with public transit agencies for appropriate transit stop locations near the Park. The implementation of these mitigation measures would reduce potential adverse impacts to less than significant at the program-level.

Biological Resources

Implementation of the proposed General Plan could result in the addition of new facilities and improvements to existing facilities that could affect native habitats and species. Species most likely to be adversely impacted include the California red-legged frog, steelhead, Coho salmon, Western pond turtle, and numerous raptors. Localized, short-term to long-term effects to special status species could occur during facility construction and as a result of increased activity associated with public use of the Park. Potential adverse effects may include vegetation disturbance and/or removal, soil compaction, root damage, erosion, wildlife harassment or mortality, and introduction and spread of non-native or invasive species. Potential mitigation measures presented in this General Plan include: facility siting and design to avoid adverse effects to sensitive vegetation communities and sensitive species; development of a natural resource protection program to include standard measures such as construction scheduling, erosion and sediment control, revegetation, topsoil salvage, fencing,

and other protective measures; development of a noxious weed abatement program; development of revegetation plans for disturbed areas; and public education aimed at reducing the introduction and spread of non-native species and wildlife harassment. Implementation of these mitigation measures would reduce potential biological resource impacts to less than significant at the program-level.

Cultural Resources

The Park is located within an area known to contain cultural resources. Potential construction activities could result in impacts to archaeological and historic resources, as well as potential impacts related to the discovery of human remains. Sensitive resources may include village sites, middens, artifacts, resource gathering areas, traditional use and spiritual areas, historic logging sites, mill sites, railroad construction sites, and home sites. Mitigation measures include complying with all applicable cultural resource protection laws, conducting archeological site monitoring, conducting data recovery excavations, protecting sensitive traditional use areas as appropriate, protecting known burial sites, and contacting the Native American Heritage Commission to determine necessary procedures for protecting and preserving Native American remains. These mitigation measures would reduce potential cultural resource impacts to less than significant at the program-level.

Geology, Soils, and Seismicity

New facilities and improvements to existing facilities that may be implemented as a result of the General Plan would be subjected to strong ground shaking in the event of a nearby earthquake, which would expose people or structures to adverse effects, including the risk of loss, injury, or death as a result of seismic ground failure, liquefaction, earthquake induced settlement, or landslides. Construction and maintenance activities and increased public use could result in soil erosion, particularly on steep areas. Some soils at the Park may be unsuitable for structures or public use. Potential construction and visitor use activities could also result in impacts to sensitive paleontological resources, such as fossils in geologic formations. Mitigation measures may include geotechnical investigations to assess seismic hazards, soil suitability, and slope stability; conformance with the Uniform Building Code; locating permanent structures outside the Alquist-Priolo Earthquake Zone; identifying landslide hazard areas; designing grading, landscaping, and irrigation to minimize potential erosion; revegetating steep slopes; discouraging the use of unimproved steep slopes; and complying with all applicable resource protection laws for protecting and preserving sensitive resources. These and other mitigation measures in the General Plan would reduce potential impacts to less than significant at the program-level.

Hazards and Hazardous Materials

Implementation of the proposed General Plan could result in construction activities that include the use of hazardous materials, expose hazardous waste that may be present at construction sites, or create fire hazards. Greater human presence and accessibility to remote areas of the Park would not result in significant risk of illegal dumping of wastes. The overall amount of pesticides and fertilizers used and stored at the Park could increase somewhat from existing levels, but would not be considered a significant impact. Potential increases in public use and an associated increase in traffic within the Park could result in runoff from oil, grease, and fuel products, as well as accidental releases of hazardous materials. Mitigation measures

to reduce these potential impacts may include incorporating requirements for sampling and analysis of potential hazardous substances into the construction contracts, coordinating with appropriate regulatory agencies regarding known or previously unidentified hazardous substances, developing a spill prevention and response plan requiring consistency with existing regulatory guidelines for all transportation, handling, and storage of construction-related hazardous material; and developing a fire response plan, in coordination with CDF and local support organizations. These and other mitigation measures in the General Plan would reduce potential impacts to less than significant at the program-level.

Land Use

Potential programmatic land use impacts associated with actions that would increase public use were determined to be less than significant and no mitigation is required. Potential increases in public use and the addition of new facilities would not disrupt or divide the physical arrangement of established surrounding uses, would be compatible with adjacent land uses, would not conflict with established recreational educational, religious, or scientific uses, and would not affect the existing character of the vicinity. There are no agricultural resources in the Park.

Noise

Implementation of the General Plan could result in noise impacts associated with construction activities that exceed local regulatory requirements. Potential new noise sources could also be associated with Plan implementation, depending on the size and location of potential facilities and uses. Mitigation in the General Plan includes measures that would limit construction noise, apply noise control measures to construction equipment, apply daily and seasonal time constraints, and limit the proximity of construction noise to sensitive receptors. These measures would reduce potential noise impacts to less than significant at the program-level.

Plans and Policies

Potential programmatic plans and policies impacts associated with the General Plan were determined to be less than significant and no mitigation is required.

Recreation

Implementation of the General Plan could result in the deterioration of Park facilities if facilities are not sized to accommodate potential use levels, are not operated and maintained or operated properly, or if expected use levels are exceeded. Mitigation measures include coordination with local and regional jurisdictions in the planning and development of Park facilities, especially trail connections, and sizing facilities appropriate to their planned use during project-level design. These mitigation measures will reduce potential recreation impacts to less than significant at the program-level.

Traffic and Circulation

Implementation of the General Plan could result in increased traffic that may impact the local and regional circulation networks in the project vicinity. In addition, implementation of the Plan could result in pedestrian and bicycle safety hazards and create demand for increased

parking. Mitigation measures could include providing additional parking within the Park to minimize parking impacts to the surrounding neighborhood; providing multiple access points into the Park to minimize congestion; promoting carpool, vanpool, and regional transit to the Park; creating separate travelways within the Park to improve safety and minimize traffic and circulation conflicts; complying with all local, regional, and state traffic regulations and requirements; and evaluating potential traffic circulation impacts, traffic impact studies, potential pedestrian and bicycle safety impacts, and potential parking impacts during project-level design. These mitigation measures will reduce potential traffic and circulation impacts to less than significant at the program-level.

Utilities and Public Services

Implementation of General Plan management actions generally would not require substantial expansion or improvement of utilities and public services; construction and operation of expansions would not likely result in significant effects on the physical environment. Full implementation of the Plan could result in some increases in demand for fire protection services, but overall these increases would be minimal. However, potential fire protection services impacts could occur if new facilities are not designed properly and proper access and water flow are not provided. Mitigation measures discussed in the General Plan include compliance with all applicable state and local codes and requirements, including the Uniform Building Code, as well as compliance with all requirements regarding emergency vehicle access, water flow requirements, and fire hydrant specifications. These mitigation measures would reduce potential impacts to less than significant at the program-level.

Water Quality and Hydrology

Implementation of the General Plan could result in increased impervious surfaces that would increase runoff and could exceed the capacity of the existing drainage system. Impervious surfaces may include sidewalks, parking lots, roads, rooftops, and compacted soil. Construction and operation activities and increased public use could result in the addition of pollutants and sedimentation to surface water runoff and result in erosion. If wetlands are located within the Park, construction activities and the location of Park facilities could result in wetlands impacts. Mitigation measures to reduce these potential impacts could include the use of permeable surfaces where possible; the use of appropriate BMPs during construction; upgrading storm water drainage facilities to accommodate increased runoff, if necessary; developing a drainage plan that will emphasize drainage systems designed to maximize the use of detention basins, vegetated areas, and velocity dissipaters to reduce peak flows; developing a Storm Water Pollution Prevention Plan prior to construction, equipping parking lots with runoff treatment systems; identifying potential wetlands prior to development; siting and designing facilities to avoid or minimize adverse effects to wetlands; and complying with all requirements, regulations, and permits for activities that may effect wetlands or water-associated habitats. Implementation of the mitigation measures included in this General Plan would reduce potential impacts to less than significant at the program-level.

Implementation of the General Plan would not result in groundwater impacts or include structures within the 100-year floodplain; no mitigation is required.

Environmental Issues to be Resolved

This EIR analyzes, at a program level, the potential environmental impacts of a broad range of policies and management actions included in the General Plan. The EIR includes mitigation measures to reduce potential impacts to less than significant at the program-level. However, the Department requires evaluation of individual projects and Management Plans, as referenced in the General Plan, at the time they are proposed for implementation, to determine the need for project- or site specific mitigations. Generally, further environmental review would be necessary if new significant environmental effects beyond those identified in this EIR would occur as a result of changes in the project description (or further detail becomes known), new circumstances or information arise, or if new mitigation measures or alternatives that would reduce one or more significant effects of the project are found to be feasible but the Department declines to adopt the measure or alternative (CEQA Guidelines Section 15162).

Project Description

The Plan section of the General Plan includes proposed park development and operations, and designates appropriate land uses and resource management. Those sections include a project location map, regional map, statement of plan objectives, and a description of the plan's technical and environmental characteristics. The Introduction and Plan sections constitute the project description. As described above, the Department will use this EIR in its decision-making process regarding approval of the General Plan and in the approval and development of subsequent project-specific proposals. If the General Plan were fully implemented as written, the following proposals would be adopted and applied, as appropriate:

- **Unit-wide Management Goals and Guidelines.** A consistent set of goals and guidelines to be applied to on-going park maintenance and operations, as well as new facility development, throughout the Park.
- **Specific Area Goals and Guidelines.** Goals and guidelines to be applied to on-going park maintenance and operations, as well as new facility development within specific portions of the Park.
- **Management Zoning and Allowable Use Intensities.** Management zoning within the Park to provide readily identifiable boundaries for specific types of activities, programs, and developments, reducing the potential for the introduction of inappropriate activities into prime resource areas. Management zones establish allowable use intensities that would prevent visitor-related impacts to resources from exceeding the threshold of significance.
- **Identified Potential Future Actions.** Potential future actions that could be implemented throughout the Park. Identified potential examples generally include, but are not limited to:
 - New visitor center
 - Additional parking
 - Relocation of the existing trail camp
 - New education facility developed in coordination with Cabrillo College
 - New all weather trail bridge

- New car accessible campground
- Shared use entrance trail in lower portion of Park
- New interpretation signage and information throughout the Park

Environmental Setting

The General Plan section entitled “Existing Conditions” describes existing Park and adjacent land uses, topography, meteorology, hydrology, floodplains, water quality, geology, geohazards, soils, plant life, animal life, aquatic life, special status species, paleontology, cultural resources, aesthetics, recreation, traffic, circulation, utilities and public services. The following presents the environmental setting for air quality, noise, hazards, and hazardous materials.

Air Quality

Air Quality Regulatory Context

Regulation of air quality is achieved through implementation of national and state ambient air quality (concentration) standards and enforcement of emissions limits for individual sources of air pollutants. The Federal Clean Air Act required the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM₁₀), and lead. These pollutants are called “criteria” air pollutants because the corresponding ambient standards satisfy criteria specified under the Clean Air Act. The State of California has established its own ambient air quality standards (SAAQS) which are generally more stringent than their national counterparts.

The Federal Clean Air Act required U.S. EPA to designate air basins, or portions thereof, as either “attainment” or “non attainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act, patterned after the Federal Clean Air Act, also required that areas be designated as “attainment” or “non attainment” but with respect to the state standards rather than the national standards.

The NCCAB is currently designated as “non attainment” for state standards for ozone and PM₁₀ (California Air Resources Board [CARB], 2000). The NCCAB is “attainment” or “unclassified” with respect to the other state and national ambient air quality standards.

Under the Federal Clean Air Act, air basins designated as “non attainment” were required to prepare air quality plans that set forth a strategy to attain the standards. The plans and programs developed for a given state are referred to as State Implementation Plans (SIPs). California’s SIP is comprised of plans developed at the regional or local level.

Under the California Clean Air Act, air basins designated as “non attainment” with respect to the state standards must prepare plans to achieve the standards or that, at a minimum, implements all feasible measures. Therefore, the Monterey Bay Unified Air Pollution Control District (MBUAPCD) prepared and adopted the 1991 Air Quality Management Plan for the Monterey Bay Region (1991 AQMP) that addressed planning requirements related to the state

ozone standard and recommended adoption of measures to control emissions. The 1997 AQMP update includes current air quality data, current population forecasts, revised emission inventory and emission forecasts, and revised transportation control measures.

Air Quality Regulatory Framework

The CARB, California's state air quality management agency, regulates mobile emissions sources and oversees the activities of Air Pollution Control Districts and Air Quality Management Districts. CARB indirectly regulates local air quality by establishing state ambient air quality standards and vehicle emission standards, conducting research activities, and planning and coordinating activities.

The MBUAPCD is the regional agency empowered to regulate air pollution emissions from stationary sources in the NCCAB. MBUAPCD regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review activities. MBUAPCD operates air quality monitoring stations that provide information on ambient concentrations of criteria air pollutants.

Existing Air Quality

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted tempered by meteorological and topographical conditions. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The Forest of Nisene Marks State Park is located within the northern portion of the North Central Coast Air Basin (NCCAB). The NCCAB is comprised of Monterey, Santa Cruz, and San Benito Counties. The semi-permanent high pressure cell over the eastern Pacific Ocean is the basic controlling factor in the climate of the air basin. In the summer, the high pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. The onshore air currents pass over cool ocean waters and bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement. The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. Typically during the fall, when surface winds become weak, north or east winds develop and transport pollutants into the NCCAB from either the San Francisco Bay area or the Central Valley. During the winter, the Pacific high pressure area has less influence on the air basin. Air frequently flows in a southeasterly direction especially during night and morning hours. Northwest winds are still dominant in the winter, but easterly flow is more frequent. The absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the basin as a whole in winter and early spring.

MBUAPCD's air quality monitoring stations provide information on ambient concentrations of criteria air pollutants. Table 8 is a five-year summary of the highest annual criteria air pollutant concentrations of ozone and PM₁₀. The ozone data shown in Table 8 are a compilation of data from all of the monitoring stations in the NCCAB since ozone is a regional pollutant. Pollutant data for PM₁₀ was collected at the Salinas air quality monitoring station. PM₁₀ is more local in character than ozone, and the Salinas monitoring station is the

closest PM₁₀ monitoring station to the project site. Air pollutant concentrations are compared with the state ambient air quality standards, which are generally more stringent than the corresponding national standards. The major criteria air pollutants are described below.

TABLE 8**AIR POLLUTANT SUMMARY, 1993-1997^A**

POLLUTANT	STANDARD ^B	1995	1996	1997	1998	1999
Ozone						
Highest one-hour average, ppm ^C	0.09	0.14	0.12	0.11	0.12	0.11
Number of standard violations ^d		8	16	1	10	3
Particulate Matter (PM₁₀)						
Highest 24-hour average, µg/m ³ ^c	50	50	50	59	52	50
Number of standard violations ^e		0	0	1	1	0
Annual Geometric Mean, µg/m ³	30	17.7	17.2	19.6	16.1	18.1

^a As a regional pollutant, ozone data represent basin-wide values based on data from all of the monitoring stations. During the 1995-1997 period, ozone exceedances were recorded at the following monitoring stations: Pinnacles, Scotts Valley, Hollister, Watsonville, Monterey, and Carmel Valley. Pollutant data for PM-10 was collected at MBUAPCD's Salinas monitoring station, 1270 Natividad Road.

^b State standard, not to be exceeded.

^c ppm - parts per million; µg/m³ - micrograms per cubic meter.

^d Refers to the number of days (in a given year) during which violations of the applicable standard were measured.

^e Typically measured every sixth day.

Note: Values in **bold type** are in excess of applicable standard.

SOURCE: California Air Resources Board, *Air Quality Data Summaries*, 1995-1999.

Ozone. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x. ROG and NO_x are referred to as precursors to ozone. Significant ozone production generally requires about three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production, and high ozone concentrations can occur miles away from the source of the precursors. Motor vehicles are generally the major source of ozone precursors.

Short-term exposure to ozone can result in injury and damage to the lungs, decreases in pulmonary function and impairment of immune mechanisms (MBUAPCD, 1995). These changes have been implicated in the development of chronic lung disease as the result of longer-term exposure. Symptoms of ozone irritation include shortness of breath, chest pain when inhaling deeply, wheezing, and coughing. In addition, effects on vegetation have been documented at concentrations below the standards. On-road motor vehicles contribute approximately 30 to 40 percent of the ROG and NO_x emitted in the NCCAB (CARB, 1995).

Particulate Matter. PM₁₀ consists of particulates 10 microns (a micron is one one-millionth of a meter) or less in diameter, which can be inhaled and cause adverse health effects. Particulates in the atmosphere result from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Agricultural activities, such as tilling, disking and field burning, are major sources of particulates in rural areas, while vehicle/equipment travel, and demolition and construction activities are major sources of particulates in urban areas. Natural sources of particulates include wind erosion from exposed surfaces. Particulate concentrations near residential sources generally are higher during the winter, when more fireplaces are in use and meteorological conditions prevent the dispersion of directly emitted contaminants. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

Sensitive Receptors

Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because infants and children, the elderly, and people with health afflictions, especially respiratory ailments, are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present.

Recreational land uses are moderately sensitive to air pollution. Although exposure periods are generally short in such places, vigorous exercise often associated with recreation places a high demand on the human respiratory functions, which air pollution can impair. Noticeable air pollution also detracts from the recreational experience.

Noise

Introduction to Noise Principles and Descriptors

Noise is defined as unwanted sound. Environmental noise is usually measured in A-weighted decibels (dBA). A decibel (dB) is a logarithmic unit of sound energy intensity. Sound waves exert a sound pressure (commonly called “sound level”), measured in decibels. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response of the human ear at commonly encountered noise levels. The highest dBA reported in a given period of time is known as the maximum noise level (L_{max}). Environmental noise typically fluctuates over time, and different types of noise descriptors are used to account for this variability. Typical noise descriptors include the energy-equivalent noise level (Leq), the day-night average noise level (L_{dn}), and the Community Noise Equivalent Level (CNEL). Leq, the energy equivalent noise level (or “average” noise level), is the equivalent steady-state continuous noise level which, in a stated period of time, contains the same acoustical energy as the time-varying sound level actually measured during the same period. L_{dn}, the day-night average noise level, is a weighted 24-hour average noise level. With the L_{dn} descriptor, noise levels between 10:00 PM and 7:00 AM are adjusted upward by ten dBA to take into account the greater annoyance of nighttime noise as compared to daytime noise. The CNEL is

calculated in a similar way, but an additional 5 dBA are added to the noise levels in the evening hours between 7:00 PM and 10:00 PM. The Ldn and CNEL are commonly used in establishing noise exposure guidelines for specific land uses. In general, a change of 3 dBA is a noticeable change and a change of 10 dBA is perceived as a doubling of noise.

The noise experienced at a receptor depends on the distance between the source and the receptor, the presence or absence of noise barriers and other shielding features, and the amount of noise attenuation (lessening) provided by the intervening terrain. For line sources, such as vehicular traffic, noise decreases by about 3.0 to 4.5 dBA for every doubling of the distance from the roadway. For point or stationary sources, such as electric motors, a noise reduction of 6.0 to 7.5 dBA is experienced for each doubling of the distance from the source.

Existing Noise Levels

Natural sounds within the Park (such as flowing water, animals, and rustling tree leaves) are not considered to be noise (unwanted sound). Existing noise within the Park results from mechanical sources, such as motor vehicles, generators, overhead aircraft and from human activities, such as talking and yelling.

Some noise heard within the Park results from automobiles, recreational vehicles, and trucks accessing the Park and traveling in adjacent areas, such as roadways. Noise from these motor vehicles is “loudest” immediately adjacent to the roadways but, due to generally low background sound levels, can be audible a long distance from the roads. Atmospheric effects such as wind, temperature, humidity, topography, rain, and fog can significantly affect the presence or absence of motor vehicle noise in various areas of the Park. The Park is characterized by ambient noise levels of less than 60 dBA, Ldn.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both duration and insulation from noise) and the types of activities typically involved. Residential areas, schools, and hospitals generally are more sensitive to noise than commercial and industrial land uses. Multi-family and single family residential areas as well as schools are located in proximity to the Park.

Noise Regulations, Plans and Policies

Noise is regulated in the project area through implementation of local general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans, and noise ordinances set forth specific standards and procedures for addressing particular noise sources and activities.

The Public Safety and Noise Element of the Santa Cruz County General Plan identified noise/land use compatibility guidelines for development in Santa Cruz County (County of Santa Cruz, 1994). For noise-sensitive land uses (residences, schools, churches, hospitals, etc.), the compatibility guidelines indicate that noise levels up to 60 dBA, Ldn are clearly acceptable.

Hazards and Hazardous Materials

Definitions

Hazardous materials and hazardous waste are defined by their levels of toxicity, ignitability, corrosivity, and reactivity. When excavated, soils with concentrations of contaminants higher than certain acceptable levels must be handled and disposed as hazardous waste. The *California Code of Regulations*, Title 22, §66261.20-24 contains technical descriptions of characteristics that would cause a soil to be classified as a hazardous waste.

Hazardous Materials and Waste Handling

The California Environmental Protection Agency (Cal-EPA), Department of Toxic Substances Control (DTSC) regulates the generation, transport, treatment, storage, and disposal of hazardous waste. Remediation of contaminated sites is performed under the oversight of Cal-EPA and with the cooperation of the Regional Water Quality Control Board (RWQCB) and the local fire department. At sites where contamination is suspected or known to occur, a site investigation and remediation plan may be required. For typical projects, actual site remediation is performed either before or during the construction phase of the project.

Background and Current Site Conditions

The Park generally contains wildlands and open space for passive recreation, picnic areas, a trail camp, and hiking trails. The Park also has barbecue pits and it can be assumed that lighter fluid and other flammable materials are used at the barbecue pits. Park maintenance includes the use of motor oil and gasoline, which are stored outside of the Park. Diesel fuel may be occasionally used at the Park and is stored off site.

There are no locations within the Park included on the California *Hazardous Waste and Substances Sites List* (Department of Toxic Substances Control, 1998).

Significant Environmental Effects and Mitigation

Aesthetics

Threshold

A project would have a significant effect on aesthetic quality if it were to:

- Have substantially negative aesthetic effects, such as activities, scale and location of facilities, or the use of materials, that are visually offensive to both visitors and Park neighbors, or that degrade the existing aesthetic character or quality of a site and/or its surroundings, or is incompatible with the character of the Park.
- Substantially degrade or obstruct scenic views from public areas.
- Produce substantial light or glare.

Potential Impacts and Mitigation Measures

Impact Aes-1. New Facilities

Implementation of the proposed General Plan could result in a number of additional facilities within the Park, primarily to enhance and support public use of the Park. Potential facilities could include a visitor and education center, trails, parking, a vehicular accessible campground, and a redeveloped backpackers campground. Installation of all potential facilities allowed by the Plan has the potential to create a significant aesthetic change, with the degree of change dependent on project-specific details to be determined at the time projects are proposed. The aesthetic change would be significant if the site selection, facility scale, or facility design caused substantial degradation of the scenic quality of the Park from public areas. Further, if lighting associated with facilities created substantial glare, the impact would be significant. Areas that are most sensitive to scenic quality degradation are those along ridgelines, which are visible from long-distance and near-distance views. For instance, a very minor structure such as a kiosk located in an environmentally non-sensitive area may not result in the same level of impact or require the same level of mitigation as a structure such as a visitor center placed in a highly visible location.

Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and Plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Aes-1. Potential aesthetic quality impacts associated with the addition of new facilities should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Implement design practices that reduce the overall negative aesthetic effect of new roads and trails, including, but not limited to:
 - Road and trail design guidelines that require use of best management practices for road location and alignment, such as locating and designing roads and trails to follow natural topography; minimizing stream crossings; avoiding large cut-and-fill road designs; and minimizing excavation.
 - Design and site new roads and trails to minimize grading and the visibility of cut banks and fill slopes.
 - Screen and restore disturbed areas with an appropriate mix of native vegetation species.
- Implement design practices that reduce the overall aesthetic effect of new facilities (including roads and trails) including, but not limited to:
 - Include screening vegetation where appropriate.

- Where grading is necessary, contour slopes and landforms to mimic the surrounding environment as much as possible.
- Incorporate architectural siting/design elements that are compatible with the applicable surroundings.
- Eliminate, wherever possible, the use of unpainted metallic surfaces and other sources that may cause increased levels of reflectivity.
- Minimize night lighting where practicable. Where night lighting is necessary, direct downward and site and shield new exterior lighting such that it is not highly visible or obtrusive.
- Maintain the silhouette of new structures below the skyline of bluffs, cliffs, or ridges.
- Design any new structural additions to historic structures to harmonize with older structural features and comply with appropriate scenic easements, aesthetic guidelines, and cultural resource guidelines and requirements.
- Encourage the salvage and selective reuse of building features if historic structures are demolished.
- Conduct project-level visual simulations for any facility to be located on prominent ridgelines.
- Screen and/or restore disturbed areas with an appropriate mix of native vegetation species.

Implementation of design guidelines and vegetation protection and restoration activities, as described above, would reduce the potential program-level aesthetic quality impact associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Aes-2. Increased Public Use

The General Plan would likely result in increased public visitation of the Park, if the following were implemented: new trails, increased information regarding public activities available at the Park (such as public use area maps and brochures) and new public activity destinations, such as a visitor center. In addition, provision of universal access improvements could result in increased public use of the Park. Increased public use would not necessarily result in adverse impacts to aesthetic resources. However, trespassing and improper use of public access areas could lead to litter, disturbed vegetation, and damage to Park facilities and resources, detracting from the aesthetic quality of the Park. Litter, disturbed vegetation, and damage to facilities and resources would constitute a significant effect, if the degradation of

aesthetic quality were substantial. Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and Plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Aes-2. Potential aesthetic quality impacts associated with increased public use should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Advocate responsible use of the Park and enforcement of the rules and regulations established for use of the Park by increasing public education and awareness of Park resource sensitivity and publishing rules and regulations for park visitors. This information would be provided in appropriate areas subject to public use, including the kiosks, entrance stations, visitor center, etc. This information should also be available through adjacent jurisdictions and public use facilities.
- Implement an inspection and maintenance program for facilities used by the public and inspection of perimeter fencing, access gates, and locks in order to minimize trespassing and illegal dumping.
- Establish coordinated enforcement of public use of the Park with adjacent jurisdictions.
- Include appropriate staffing to monitor public use of the Park and enforcement of Park rules and regulations.

Implementation of the above measures would reduce the potential program-level aesthetic impacts related to increased public use associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Air Quality

Threshold

The following thresholds determine significance with respect to air quality. Air quality impacts would be considered significant if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standards or contribute substantially to an existing or projected air quality violation.

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentration.
- Create objectionable odors affecting a substantial number of people.

Potential Impacts and Mitigation Measures

Impact Air-1. Potential Construction-Related Emissions Impacts

Implementation of the proposed General Plan could result in construction projects for the provision of additional public use opportunities and related facilities. Types of facilities that could be constructed under the General Plan include a new visitor center, new trails, and information kiosks.

Construction or demolition activities associated with potential General Plan projects could generate substantial amounts of dust (including PM₁₀ and particles with diameters of 2.5 microns or less [PM_{2.5}]) primarily from “fugitive” sources and lesser amounts of other criteria air pollutants, primarily from operation of heavy equipment. Fugitive emissions generally refer to those emissions that are released to the atmosphere by some means other than through a stack or tailpipe. Fugitive dust emissions typically include emissions from onsite surface disturbance activities and offsite vehicular travel on unpaved roadways. A large portion of the potential construction dust emissions would result from equipment and vehicle traffic over paved and unpaved roads and the use of temporary, unpaved parking lots at construction sites. Potential dust emissions from construction would vary from day to day, depending on the level and type of construction activity, the silt content of the soil, and the prevailing weather.

Exhaust from potential construction equipment, haul trucks, and construction-worker commute trips, would also result in increased PM₁₀ levels, along with other criteria air pollutants such as CO, NO_x, and ROG. Potential asphalt paving and application of architectural materials would also result in evaporative emissions. Criteria pollutant emissions of ROG and NO_x from these emissions sources would incrementally add to regional atmospheric loading of ozone precursors during construction of projects that could be implemented under the General Plan.

In the absence of mitigation, potential construction or demolition activities could result in significant quantities of dust and air emissions, and, as a result, local visibility and PM₁₀/PM_{2.5}, and criteria air pollutant concentrations could be adversely affected. Without mitigation, air quality impacts by construction or demolition activities could have a significant but temporary effect in the immediate vicinity of individual sites. Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and Plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Air-1. Potential construction-related emissions impacts should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Implement construction projects in a manner that minimizes the area of surface disturbance (e.g., grading, and excavation), the number of vehicle trips on unpaved surfaces, and concurrent use of diesel equipment and other equipment or activities that release emissions. Minimizing these effects may entail clustering certain construction activities or performing them in a particular order.
- Incorporate state and local fugitive dust abatement measures and approved BMPs into project scope, as appropriate. These may include: water or otherwise stabilize soils, cover haul trucks, employ speed limits on unpaved roads, minimize vegetation clearing, and revegetate disturbed areas post-construction.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.
- Ensure that any stationary motor sources (such as generators and compressors) located within 100 feet of any residence or public facilities (sensitive receptors) are equipped with a supplementary exhaust pollution control system as required by the California Air Resources Board.
- Take appropriate measures to control pedestrian access to active construction areas. Recreational users should be kept a minimal distance from the operation of all construction equipment, except trucks hauling materials to and from the Park.

All of these measures may not apply at each construction site. Generally, larger, more intensive construction or demolition projects require more comprehensive dust abatement programs and mitigation practices than smaller, less intensive projects.

Implementation of the practices described above would reduce the potential program-level construction-related emissions impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Air-2. Potential Operational Emissions Impacts

Implementation of the proposed General Plan may result in an increase in public use and an associated increase in vehicle trips to the Park. Increased motor vehicle emissions would be the largest sources of pollutants resulting from implementation of the projects that could be implemented under the General Plan. Traffic levels would increase due to increases in visitation to the Park and jobs related to the administration, operations, and maintenance of

the Park. No stationary on-site emissions are envisioned as a result of the General Plan. Some stationary emissions resulting from electrical energy demand projected for the Park would occur off-site at electrical power generating plants located throughout the utility's generating network. The total stationary emissions are relatively small compared to total potential motor vehicle emissions.

Facilities or projects in the Basin with daily operation-related emissions that exceed the regional thresholds, creating a significant air quality impact. Motor vehicle emission estimates can be used to account for most of the potential total daily operation-related emissions of the Park associated with implementation of the General Plan. Modeling can provide estimates of motor vehicle emissions based on average trip length and the number of new trips generated. While the potential increase in trip generation resulting from implementation of the General Plan is not known at this time, modeling provides an idea of the relative traffic levels that would exceed the established emissions thresholds. A model based on the CARB EMFAC-2000 emissions model published in 2000 shows that 900 vehicle trips of average trip distance of 25 miles (one way) would result in emissions levels that are below the thresholds.

Mitigation Measure Air-2. Potential operational emissions impacts should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Pave roads that will be used by motor vehicles, to the extent feasible, to limit fugitive dust (PM₁₀) emissions.
- Work with local public transit agencies to offer schedules that meet Park use demand, and that allow bikes and other recreational equipment on transit routes in proximity to the Park.
- Design Park roads in a manner that reduces vehicle queuing and provides easy bus turnarounds to limit proximate CO emissions.
- Provide reserved and preferentially located carpool/vanpool parking spaces.
- Employ site plan design and building design mitigation measures that have been developed by the local air quality management district. This may include building orientation to the north for natural cooling, the use of energy efficient appliances and lights, increased insulation and window treatments, light-colored roof materials to reflect heat, shade trees to reduce building's heat, use of building materials that do not require use of paints/solvents, and/or centralized water heating systems.

The General Plan includes program-level specifications that would comply with air emissions standards. Foremost, the General Plan emphasizes non-vehicular public access to the Park via connections to pedestrian and bicycle trails and to public transit. The General Plan also aims to cluster visitor facilities and active recreation areas to maximize public access and connections to public transportation. For instance, locating the trailheads that serve the trail system at the visitor center could reduce intra-park vehicle trips. Moreover, the General Plan

aims to implement energy-efficient practices in the design and operation of proposed facilities, including use of solar and other non-fuel dependent energy sources, where feasible.

If implementation of the General Plan does not result in a daily traffic volume higher than 900 vehicle trips of average length 25 miles, then the air quality impact would likely be less than significant; however, projected traffic volumes are not known at this time. Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and Plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Implementation of the measures described above would reduce the potential program-level operational emissions impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Biological Resources

Threshold

Implementation of the General Plan would have a significant effect on biological resources if it were to:

- Have a substantial adverse effect (such as direct take or removal) on any species identified as threatened, endangered, candidate, or sensitive (rare), as defined in CEQA Guidelines Section 15380;
- Have a substantial adverse effect on the habitat of endangered, threatened, or rare species, or other sensitive natural community identified in local or regional plans, policies, regulations, or on lists compiled by CDFG or USFWS (defined as substantial reduction, disturbance, or alteration, or actions that reduce, disturb or alter critical habitat, cause a fish or wildlife habitat to drop below self-sustaining levels, reduce the number or restrict the range, or threaten to eliminate an animal community);
- Have a substantial adverse effect on federally protected wetlands (including, but not limited to, marshes and riparian areas) as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of CDFG, as defined by Fish and Game Codes 1601-1603, through direct removal, filling, hydrological interruption, or other means;
- Substantially interfere with the movement of any native resident or migratory fish or wildlife species, or with established migratory or dispersal corridors; or

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Potential Impacts and Mitigation Measures

Impact Bio-1. Potential Effects to Native Habitats and Species

Implementation of the proposed General Plan may result in the addition of new facilities and improvements to existing facilities that could affect native habitats and species. Localized, minor, short-term, temporary and/or permanent effects on native vegetation could occur from construction (e.g., potential visitor center and/or day-visitor parking facility, other new facilities) and visitor use impacts. Effects related to construction, heavy equipment, and visitor use activities could include soil compaction, dust, vegetation removal, wildlife harassment or mortality, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native vegetation or wetlands.

Although site-specific short- and long-term negative effects to native habitats and species could occur as the result of future actions that could be implemented under General Plan, the overall design of the Plan would also provide increased protection for native habitats. The Park would be managed to protect significant natural resources while providing a diverse visitor experience. Although portions of the Park would remain developed or could be further developed, the proposed management zoning overall would preclude several types of new development (e.g., campgrounds or overnight visitor lodging) that have the potential to adversely affect native vegetation. In addition, possible future actions (e.g., construction of new facilities) that could occur under the proposed management zoning, would be subject to the consistent set of goals and guidelines which would guide how the action could be implemented. The application of zoning in combination with the consistent set of goals and guidelines would have a short- and long-term, negligible, beneficial effect on native habitats.

Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Bio-1. Potential effects to native habitats and species should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Conduct appropriate vegetation and wildlife surveys as part of future project-specific planning.
- Site and design facilities/actions to avoid or minimize adverse effects to sensitive vegetative communities and wildlife habitats.

- Develop a natural resource management plan. Standard measures may include construction scheduling, biological monitoring, erosion and sediment control, use of fencing or other means to protect sensitive resources adjacent to construction, topsoil salvage, and revegetation. This could include specific construction monitoring by resource specialists, as well as treatment and reporting procedures.
- Implement a noxious weed abatement program. Standard measures could include the following elements: ensure construction-related equipment arrives on-site free of mud or seed-bearing material, certify all seeds and straw material as weed-free, identify areas of noxious weeds pre-construction, treat noxious weeds or noxious weed topsoil prior to construction (e.g., topsoil segregation, storage, herbicide treatment), and revegetate with appropriate native species.
- Develop revegetation plans for disturbed areas and require the use of native species. Revegetation plans should specify seed/plant source, seed/plant mixes, soil preparation, etc. Vegetation collected on site should be used to the extent possible.
- Night lighting shall be minimized, and when necessary, lighting shall be shielded and directed downward to reduce potential disturbance to wildlife.

Implementation of the measures described above would reduce the potential program-level effects to native habitats associated with the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Bio-2. Potential Effects on Special Status Species

Implementation of the proposed General Plan may result in the addition of new facilities and improvements to existing facilities that could affect special status species. Special status species that could be affected include, but are not limited to, the California red-legged frog, steelhead, Coho salmon, Western pond turtle, and raptors. The type and extent to which a particular species would be affected is dependent on the type and location of the facility proposed and type and timing of construction activities. Localized, minor, short-term, to long-term effects to special status species could occur from construction of potential facilities. Effects would be related to heavy equipment and construction activities and could include direct removal of habitat, harassment or mortality, and introduction and spread of non-native species.

Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Bio-2. Potential impacts to special status species should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Implementation of Mitigation Measure Bio-1, above.
- Conduct surveys for rare, threatened, and endangered species as part of the planning process for site-specific project developments.
- Site and design facilities/actions to avoid and/or minimize adverse effects to rare, threatened, and endangered species, in consultation with the appropriate resource agencies.
- Develop and implement restoration and/or monitoring plans as warranted. Plans should include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.
- Implement measures to reduce adverse effects of non-native plants and wildlife on rare, threatened, and endangered species, such as developing and implementing an invasive species management program, identifying and controlling aggressive non-native species, and revegetating disturbed areas with appropriate native species.

Implementation of the design measure described above would reduce the potential program-level special status species impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Bio-3. Potential Increase in Public Access and Use

Implementation of the proposed General Plan would result in the addition of new facilities and improvements to existing facilities that could increase public access and use of the Park. With increased activity associated with public use of the Park, invasive species would likely be transported by visitors onto Park land at a greater rate than occurs at present. Seeds of invasive species are likely to be dispersed by such vectors as the boots of hikers and the tires of bicycles and cars. Invasive plant species may cause:

- A decline in distribution and density of native wildlife habitat;
- A decrease in native plant diversity; and,
- A direct modification of the environment, such as transformation from a sensitive plant community to a non-native habitat.

The establishment of a viable population of invasive, non-native species in ecologically sensitive areas may also lead to alterations in the community composition, diversity, and

richness of wildlife and plants. Potentially significant loss of vegetation and wildlife due to increased recreational activities may be caused by:

- Excessive noise, trampling, or rapid movements resulting in harassment to wildlife;
- Increased garbage, road-kills, and trash that attract corvids, resulting in nest predation; loss of species diversity; and,
- Off-trail activity resulting in habitat destruction and/or fragmentation and spread of invasive species.

Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Bio-3. Potential biological resources impacts related to increased public access and use should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Educate the public concerning non-native species and the effects they have on native vegetation and wildlife.
- Educate the public on the dangers of intentional or unintentional feeding of Park wildlife, and on inadvertent wildlife harassment through observation or pursuit.
- Informally evaluate impacts on native vegetation at public use areas, such as trails, trailheads, picnic areas, campgrounds, etc.

Implementation of the design measures described above would reduce the potential program-level biological resources impacts related to increased public access and use associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Cultural Resources

Threshold

The project may result in a significant impact, if it would:

- Cause a substantial adverse change in the significance of an historical or archaeological resource pursuant to CEQA Section 15064.5, such as physical demolition, destruction, relocation, or alteration of the resource or its immediate

surroundings, such that the significance of the historical resource would be materially impaired.

- Disturb any human remains, including those interred outside of formal cemeteries.

Potential Impacts and Mitigation Measures

Impact Cul-1. Potential Archaeological Resources Impacts

Implementation of the proposed General Plan may result in the addition of new facilities. Excavation related to Park development may yield archaeological resources not previously discovered, may disturb ethnographic sites, and may introduce visitor use to, or near, previously isolated cultural resources. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Cul-1. Potential archaeological resources impacts should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Subject projects to site-specific planning and compliance in accordance with cultural resource protection laws, Secretary of the Interior's Standards for the Treatment of Historic Properties, and the California Historic Building Code.
- Site and design facilities/actions to avoid adverse effects to sensitive cultural resources. Subject projects to site-specific planning and compliance in accordance with cultural resource regulations. Conduct archeological site monitoring and routine protection. Conduct data recovery excavations at archeological sites threatened with destruction, where protection or site avoidance during design and construction is infeasible.
- Avoid or mitigate impacts to ethnographic resources. Identify and assist in accessing alternative resource gathering areas, continue to provide access to traditional use and spiritual areas, and screen new development from traditional use areas.
- Consult with appropriate Native American representatives as identified by the Native American Heritage Commission (NAHC). Formalize a Park-wide gathering plan. Follow DPR and NAHC procedures for the disposition of Native American artifacts and human remains. Protect known burial sites, and protect sensitive traditional use areas to the extent feasible.
- Conduct surveys for archeological sites, traditional resources, historic sites, structures, and cultural landscape resources as appropriate. Surveys and reports shall be prepared in compliance with the recommendations of the Native American Heritage Commission.

- Provide a DPR-qualified archaeologist (and Native American tribal representative, if appropriate) to monitor any subsurface operations, including but not limited to grading, excavation, trenching, or removal of existing features of the subject property.
- In the event cultural resources are encountered in the Park during the course of construction; the findings shall be examined by a qualified archaeologist or historian. If the finding is determined to be an historical or unique archaeological resource, avoidance measures or appropriate mitigation shall be implemented. Recommendations can then be made for any appropriate procedures to either further investigate or mitigate impacts to those cultural resources that have been encountered. As provided in the CEQA Guidelines, Section 15064.5(f), work could continue on other parts of the Park while historical or unique archaeological resource mitigation (if necessary) takes place.

Implementation of the requirements described above would reduce the potential program-level archaeological resources impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Cul-2. Potential Historic Resources Impacts

Implementation of the proposed General Plan could result in the addition of new facilities and increased park use. Construction of new facilities and/or increased park use has the potential to adversely affect historic resources in the Park and damage of previously unknown cultural sites during construction, and also by increasing the threat of vandalism or damage due to the proximity of public use facilities near sensitive cultural resources. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Cul-2. Potential historic resources impacts should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Subject projects to site-specific planning and compliance in accordance with cultural resource protection laws.
- Site and design facilities/actions to avoid adverse effects to sensitive cultural resources. Subject projects to site-specific planning and compliance in accordance with cultural resource regulations. Conduct historic site monitoring and appropriate protection. Conduct data recovery excavations at historic sites threatened with

destruction, where protection or site avoidance during design and construction is infeasible.

- Conduct surveys for historic sites.
- A DPR-qualified historian shall monitor construction activities, as necessary, in areas of known or potential historic resources. These activities include but are not limited to grading, excavation, trenching, or removal of existing features of the historic property. As provided in the CEQA Guidelines, Section 15064.5(f), work could continue on other parts of the Park while historical or unique archaeological resource mitigation (if necessary) takes place.

Implementation of the requirements described above would reduce the potential program-level historic resources impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Geology, Soils, and Seismicity

Threshold

A significant geology, soils and/or seismicity impact would be expected to occur if the project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - Rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; (Refer to Division of Mines and Geology (CDMG) Special Publication 42);
 - Strong seismic ground shaking;
 - Seismic-related ground failure, including liquefaction; or
 - Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- Directly or indirectly destroy a unique paleontological resource, site, or unique geologic feature.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

- Be located on expansive soil creating substantial risks to life or property.
- Include a wastewater treatment component in soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Potential Impacts and Mitigation Measures

Impact Geo-1. Potential Seismic Impacts

Implementation of the proposed General Plan could result in the addition of new facilities and improvements to existing facilities that would be subjected to strong ground shaking in the event of a nearby earthquake. This event could expose people or structures to adverse effects, including the risk of loss, injury or death as a result of seismic ground failure, liquefaction, earthquake induced settlement, or landslides.

The project area is susceptible to impacts from seismic activity. As described in the section entitled “Existing Conditions,” numerous active faults are known to exist in the region that could potentially generate seismic events capable of significantly affecting proposed facilities. Potential affects from surface rupture and severe ground shaking could cause catastrophic damage to Park facilities. Seismically induced landslides could create hazardous conditions in the Park. Much of the Park lies within landslide hazard areas.

Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Geo-1. Potential seismic impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Geotechnical investigations shall be performed as part of the planning of any project facilities. The studies shall assess seismic hazards and soil suitability. Recommendations provided in these investigations shall be implemented, to the extent feasible.
- Project facilities shall be constructed in accordance with Uniform Building Code earthquake design standards.
- Project facilities located within Alquist-Priolo Fault Zones shall be designed in accordance with Special Publication 117 and the Uniform Building Code.
- Permanent structures shall be located outside of Alquist-Priolo Earthquake Zones and landslide hazard areas identified in the Seismic Hazards Maps when possible.

Implementation of design measures, as described above, would reduce the potential program-level seismic impacts associated with the implementation of the General Plan. However, the

Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Geo-2. Potential Erosion Impacts

Much of the Park area is comprised of steep hillsides naturally susceptible to erosive forces. Implementation of the proposed General Plan would result in the addition of new facilities and increased public use. Over-use by park visitors, decreased vegetation, over-watering, and poorly engineered grades could increase erosion potential. In addition, development of the site would require removal of vegetative cover and grading in some areas of the Park. During grading activities, bare soil would be subject to increased erosion from rain and wind.

The reduction of overall permeable area could also increase erosion potential by leading to greater water runoff rates and concentrated flows that have greater potential to erode exposed soils. The effects of excessive erosion range from problems that require additional maintenance, such as increased siltation in storm drains, to extreme cases where water courses are down cut and gullies develop, which can eventually undermine adjacent structures or vegetation. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Geo-2. Potential erosion impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Final grading plans shall be designed to minimize soil erosion potential.
- Cover bare exposed soil with appropriate materials during and after construction to avoid increased erosion and sedimentation.
- Steep slopes shall be vegetated or protected to reduce erosion potential.
- Avoid facility development on steep slopes with potential erosion problems, to the extent feasible. Design facilities to discourage walking or biking on unimproved, steep slopes.
- Conceptual drainage plans shall be prepared to accompany grading permit applications.
- Landscape and drainage plans shall incorporate measures to minimize erosion potential.

Implementation of design measures and plans, as described above, would reduce the potential program-level erosion impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Geo-3. Potential Paleontological Resources Impacts

Geologic formations underlying the project area are considered to be potentially fossiliferous (containing fossils). Implementation of the proposed General Plan could result in the construction of additional public use and support facilities. Excavation in the project area would likely encounter the Pleistocene and Pliocene formations, which may include significant fossil vertebrate remains. Since many of the significant vertebrate fossils that may be encountered are relatively small, examination of the excavated rock for these finds would be essential. Because implementation information, such as locations of specific facilities and development of project-specific Management Plans, is not yet known, specific facilities and Plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Geo-3. Potential paleontological resources impacts should be reviewed at the project-level for specific facilities or Management Plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Consult with a qualified paleontologist during the planning and construction of facilities requiring ground-disturbing activities, to ensure proper procedures are implemented to avoid, or record and recover significant fossil resources. Provide DPR-qualified monitors as necessary during the construction phase.
- Evaluate sites for evidence of fossils prior to ground-disturbing activities.

Implementation of the requirement described above would reduce the potential program-level paleontological resources impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and Management Plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Geo-4. Potential Unsuitable Soils Impacts

Some soils within the Park could be unsuitable for building that could occur under implementation of the General Plan. Highly erodible soils, such as the Purisima Formation, could suffer from slope failure or landslide. Other soils may not be suitable for septic

systems. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Geo-4. Potential unsuitable soils impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- A site-specific geologic report shall be developed as part of the planning process for project facilities located in potentially hazardous areas. The report shall assess seismic hazards, slope stability, and soil suitability.
- A certified engineering geologist or civil engineer shall approve all grading and filling operations.
- A survey shall be conducted for new and abandoned wells, if appropriate, to ensure the stability of nearby soils.
- If septic systems are needed, they shall be designed to comply with the appropriate Regional Water Quality Control Board requirements.

Implementation of investigations and design measures, as described above, would reduce the potential program-level unsuitable soils impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Hazards and Hazardous Materials

Threshold

A project would normally result in significant hazards and hazardous materials impact if it would:

- Involve a substantial risk of accidental explosion or release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, fuels, or radiation).
- Contain sites that are included on the *Hazardous Waste and Substances Sites List* and, as a result, create a significant hazard to the public or the environment.
- Expose people to existing sources of potential hazards, including hazardous materials.
- Create a public health hazard or potential public health hazard.

- Potentially interfere with an emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas.

Potential Impacts and Mitigation Measures

Impact Haz-1. Potential Construction Phase Hazardous Sites Impacts

Implementation of the proposed General Plan could result in the addition of a number of new facilities in the Park, thereby generating construction projects. Construction of potential facilities would require the excavation and disturbance of soils that may be contaminated. Historic land uses in some areas may have resulted in the contamination of soil and/or groundwater. These land uses include those that supported underground storage tanks or vehicle use (such as equipment storage and maintenance areas), and any such areas could contain leaked petroleum hydrocarbons. Areas of contamination associated with past land uses could be encountered during construction activities. Dewatering of contaminated groundwater from any trenches and other excavations could expose individuals and the environment to hazardous levels of contaminants. Similarly, body contact with contaminated soil or groundwater could lead to inadvertent exposure to contaminated materials. Furthermore, dust composed of contaminated soil particles could be inhaled. The impact of potential exposure to hazardous materials is considered potentially significant.

Exposure to hazardous materials or wastes could cause various short-term or long-term health effects. Possible health effects could be acute (immediate, or of short-term severity), chronic (long-term, recurring, or resulting from repeated exposure), or both. Acute effects, often resulting from a single exposure, could result in a range of effects from minor to major, such as nausea, vomiting, headache, dizziness, or burns. Chronic exposure could result in systemic damage or damage to organs, such as the lungs, liver, or kidneys. Health effects would be specific to each hazardous substance.

Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Haz-1. Potential construction phase hazardous site impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- The Department shall incorporate into construction contract specifications the requirement that in the event that known or previously unidentified hazardous substances are encountered during construction, the contractor has a contingency plan for sampling and analysis of potentially hazardous substances, and coordination with the appropriate regulatory agencies. The Department shall also prepare a similar contingency plan for work performed by DPR personnel. Any site investigations or remediation shall be performed in accordance with applicable laws.

- Implementation of Mitigation Measure Air-1 would control fugitive dust and reduce the potential for inhalation of any contaminated dust during soil disturbing activities.

Implementation of the measures described above would reduce the potential program-level construction phase hazardous sites impacts associated with the implementation of the General Plan. However, the Department would require examination of specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Haz-2. Potential Construction Phase Hazardous Materials Release Impacts

Implementation of the proposed General Plan would result in the addition of new or the expansion of existing facilities. Potential construction activities would require the use of certain potentially hazardous materials, such as fuels, oils, bentonite, and solvents. These materials would generally be used for excavation equipment, generators, and other construction equipment and would be contained within vessels engineered for safe storage. Spills during onsite fueling of equipment or upset conditions (i.e., puncture of a fuel tank through operator error or slope instability) could result in a release of fuels or oils into the environment, including drainages within or adjacent to the Park. Storage of large quantities of these materials at the construction sites is not anticipated. However, potential release of these materials would be a potentially significant impact. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measures Haz-2. Potential construction phase hazardous materials release impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- The Department or its contractor(s) shall prepare a spill prevention and control plan that requires all transport, storage, and handling of construction-related hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the Regional Water Quality Control Board and the county. A spill kit shall be maintained on-site throughout the life of the project.

Implementation of the measures described above would reduce the potential program-level construction phase hazardous materials release impacts associated with the implementation of the General Plan. However, the Department would require examination of specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Haz-3. Potential Construction Phase Fire Hazard Impacts

Implementation of the proposed General Plan would result in new or expanded Park facilities. Sparks from potential construction activities, such as welding and cutting could ignite dry brush and wood structures. If such a fire occurred and spread to adjacent areas, damage to Department property and wildlife habitat, and public health and safety risk could occur. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Haz-3. Potential construction phase fire hazard impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- The Department shall incorporate fire safety recommendations into all project plans and contract specifications, such as:
 - Remove dry brush from the project construction area and immediate vicinity as necessary to reduce fire risk to a manageable level.
 - All equipment shall be equipped with spark arresters, except those exempted by regulation.
 - During periods of high fire danger, as determined by local fire fighting agencies, a water truck shall remain on-site for the duration of the project.
 - In the event that project construction ignites a fire, the State Representative and/or contractor shall notify DPR staff and local fire-fighting agencies immediately, in a manner consistent with the project's fire safety plan.

Implementation of requirements described above would reduce the potential program-level construction phase fire hazard impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Haz-4. Potential Operation-Related Hazard Impacts

Implementation of the proposed General Plan could result in an increase in public use and associated increase in traffic within the Park, although the Plan emphasizes non-vehicular public access to the Park and program-level design specifications to reduce reliance on motor vehicles within the Park. An increase in traffic would result primarily from visitation to the Park and any jobs related to park administration, operations, and maintenance. The increase in motor vehicle traffic could result in runoff from oil, grease and fuel products as well as accidental releases of hazardous materials. Routine park operation and maintenance may also

require the use of pesticides that may be considered hazardous if not used and stored properly. Normal park visitor use (picnics, camping) during high fire danger seasons may increase the wildfire potential in the area. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Haz-4. Potential operation-related hazard impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Parking areas shall be designed to contain or direct contaminated runoff (e.g., containing oil, grease, fuel products, or pesticides) away from soils, waters, and high-use areas of the Park.
- Pesticide use shall comply with all applicable requirements for handling and storage.
- During periods of high fire danger, as determined by local fire fighting agencies or the California Department of Forestry, fire management recommendations, such as limiting or banning the use of fire at day use picnic sites and overnight campsites, and temporarily limiting or restricting access to backcountry or wilderness areas, shall be enforced, as appropriate.
- A defensible clear zone shall be maintained around all structures, in compliance with local and state fire safety recommendations.

Implementation of the measures described above would reduce the potential program-level operation-related hazard impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Noise

Threshold

A project would normally result in a significant noise impact if it would:

- Expose persons to or generate noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies.
- Expose persons to or generate excessive groundborne vibration or groundborne noise levels.

- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise.

Potential Impacts and Mitigation Measures

Impact Noise-1. Potential Construction Noise Impacts

Implementation of the proposed General Plan would result in construction projects related to the provision of additional public use opportunities and facilities, and additional support facilities. Types of facilities that could be constructed under the General Plan include a new visitor center, new trails, and information kiosks. Construction or demolition activities associated with potential General Plan projects could generate substantial amounts of noise within proximity of individual construction sites.

The location and schedule of specific construction projects that could occur under the General Plan are unknown at this time, but could occur at locations that would adversely affect the experience of park users and/or the noise environment of off-site sensitive land uses. Recreational land uses are sensitive to noise and excessive noise detracts from the recreational experience (in duration or intensity). Other sensitive noise receptors include the residences and other park lands immediately adjacent to the Park.

Construction of the potential projects would result in temporary, intermittent increases in ambient noise levels. Construction noise levels at the project area would fluctuate depending on the particular type, number, and duration of use of various construction equipment. The effect of construction noise would depend on the volume generated and the distance between construction activities and noise-sensitive receptors. Noise levels of typical commercial construction equipment are shown in Table 9 below.

The local noise ordinances provide specific thresholds of significance for noise resulting from construction activities. Noise from construction equipment in the Park, and haul trucks accessing the Park could result in noise levels that exceed the threshold when operated without noise controls and in areas near residences. Without noise controls and other mitigation measures, noise impacts by construction or demolition activities could have a significant temporary impact. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for

implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

TABLE 9**TYPICAL COMMERCIAL CONSTRUCTION NOISE LEVELS**

EQUIPMENT	DBA AT 50 FEET ^A	DBA AT 50 FEET ^A
	(WITHOUT CONTROLS)	(WITH CONTROLS)
Backhoe	85	75
Bulldozer	80	75
Graders	85	75
Frontend loader	79	75
Dumptrucks	91	75
Concrete Pump	82	75
Flat bed delivery truck	91	75
Crane	83	75
Pumps	76	75

^a Estimates correspond to a distance of 50 feet from the noisiest piece of equipment and 200 feet from the other equipment associated with that phase.

^b Implementing controls may include selecting quieter procedures or machines and implementing noise-control features requiring no major redesign or extreme costs (e.g., improved mufflers, equipment redesign, use of silencers, shields, shrouds, and ducts, and engine enclosures).

Source: U.S. Environmental Protection Agency, 1971

Mitigation Measure Noise-1. Potential construction noise impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Activities required to ensure compliance with CEQA and local noise ordinances shall be implemented, as applicable. This may include measuring ambient noise levels on a regular schedule, posting informational signs containing construction schedules and contacts for noise complaints, and/or reporting protocols.
- Impact tools used for project construction shall be hydraulically or electrically powered wherever possible. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to 10 dBA. External jackets on the tools themselves shall be used where feasible, which could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible.

- Noise control measures shall be applied to construction equipment. Equipment and trucks used for project construction shall utilize normal noise control techniques (e.g., mufflers in good working order).
- Construction equipment shall not be operated during sensitive times of the day. Seasonal time constraints may also need to be implemented, particularly as they relate to the protection of sensitive species.
- Plan construction activities so that additive noise and duration is minimized (e.g., avoid concurrent use of loud construction equipment).
- Take appropriate measures to control pedestrian access to active construction areas. Recreational users should be kept at a safe distance from the operation of construction equipment.
- Limit the proximity of construction noise to sensitive receptors. Stationary noise sources, such as diesel generators, shall be located as far from sensitive receptors as possible. Haul-trucks and other construction equipment shall be restricted to routes that practicably avoid sensitive receptors.

Implementation of requirements described above would reduce the potential program-level construction noise impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Noise-2. Potential Operational Noise Impacts

Implementation of the proposed General Plan would apply management zoning to the Park and could result in additional noise sources associated with the operation of the potential new park facilities and activities. The Plan envisions the Park as a destination point and anticipates an increase in the number of visitors to the Park, if Plan components were implemented. The amount of vehicular traffic to the Park is expected to grow, resulting in additional noise among roadways leading to and from the projects, but the amount of the increase is unknown.

While implementation of the General Plan could result in additional noise sources, the Plan includes several components that would limit the level of additional noise associated with Plan development. The General Plan aims to limit the amount of vehicular traffic both to and within the Park by emphasizing non-vehicular public access to the Park via connections to pedestrian and bicycle trails and to public transit. Moreover, private vehicles would not have access throughout the Park, limiting areas that could be affected by vehicular noise. Locating the trailheads that serve the trail system at the two visitor centers would help to contain vehicular traffic and reduce intra-park vehicle trips. The General Plan intends to group

together active recreation areas and facilities to maximize public access and connections to public transportation.

Potential visitor activities such as recreation and educational field trips could also contribute noise to the environment.

The Park is not located within an airport land use plan or within the vicinity of a private airstrip such that it would expose visitors or employees of the Park to noise levels greater than 65 dBA.

While components of the General Plan may reduce potential noise sources, potential impacts could be associated with Plan implementation, depending on the size and location of potential facilities and uses. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Noise-2. Potential operational noise impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan. The General Plan specifies the need to include adequate setbacks from adjacent neighborhoods and the use of existing topography, and restored ecological areas without recreational access to separate park activities from adjacent residents. If necessary, fences or other barriers could be utilized to restrict public access. Buffer areas could also reduce noise levels heard at nearby residential areas from noise caused maintenance equipment. Mitigation measures shall be implemented, as appropriate, including but not limited to:

- The design of new facilities shall incorporate specifications that reduce noise impacts to nearby residences or other sensitive uses, and will be operated in compliance with relevant local noise ordinances.
- Operation of maintenance equipment such as mowers should abide by the local noise ordinances.
- Speed limits should be placed on roads accessing the Park to reduce noise levels caused by motor vehicle traffic.
- Scheduling of recreational events and educational field trip visits should be consistent with appropriate local noise ordinances.

Implementation of the requirements described above would reduce the potential program-level operational noise impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Recreation

Threshold

Recreation impacts would be considered significant if the project would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Potential Impacts and Mitigation Measures

Impact Rec-1. Potential Deterioration of Recreation Facilities

Implementation of the proposed General Plan would result in the addition of new facilities designed to improve and expand public recreation opportunities. Implementation of the Plan could also result in increases in use of other adjacent public recreation facilities that connect to the Park, such as nearby regional trails. Deterioration of existing park facilities and adjacent facilities could occur if facilities are not sized to accommodate potential use levels, are not operated and maintained or operated properly, or if expected use levels are exceeded. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Rec-1. Potential deterioration of recreation facilities should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Project level facility design shall include appropriate sizing and capacity for planned use. Consult with adjacent jurisdictions to ensure connecting trails and planned facilities are compatible with existing uses and capacities.
- Project level facility design shall include associated maintenance requirements.

Implementation of the measures described above would reduce the potential program-level recreation facility deterioration impacts associated with the implementation of the General Plan. However, the Department would require examination of specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Rec-2. Potential Physical Effects Associated with New Recreation Facilities

Implementation of the proposed General Plan would improve public use and infrastructure facilities at the Park, allowing the Park to develop reliable, lasting facilities that support recreational use by the public. Potentially significant environmental effects associated with construction and operation of potential new facilities are identified throughout this impact discussion. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Rec-2. In order to address potential adverse physical effect on the environment associated with the construction and operation of proposed recreation facilities to less than significant, the mitigation measures included throughout this analysis would be implemented.

Significance After Mitigation: Less than significant.

Traffic and Circulation**Threshold****Traffic Circulation**

Generally, traffic impacts associated with the proposed project would have a significant effect on traffic circulation if it were to:

- Cause an increase in traffic that is substantial in relation to existing traffic load and capacity of the street system and facilities (as defined by local government plans and policies).
- Interfere with the existing transportation network, causing substantial alterations to circulation patterns or major traffic hazards.

Pedestrian and Bicycle Safety

Generally, impacts to pedestrians and bicyclists related to the project may have a significant effect if they were to:

- Result in a substantial hazard to pedestrians or bicyclists.
- Substantially constrain or discourage access to the Park.

Parking

Generally, implementation of the proposed project could have a significant effect if it were to:

- Result in a substantially, unmet parking demand that leads to hazardous pedestrian and traffic conditions.

Potential Impacts and Mitigation Measures

Implementation of the proposed General Plan would result in the addition and enhancement of new facilities such as parking lots, a visitor/education center, a vehicle accessible campground, and informational kiosks and signage throughout the Park. As individual project management actions, including the construction of new facilities and development of project specific management plans, become more clearly defined, they will be subject to subsequent project-specific environmental review and accompanying traffic impact analyses. At the time individual facilities and management plans are developed and analyzed in detail, mitigation measures will be developed specific to each project that will reduce the project's impact to transportation and parking to less than significant levels. Adopted significance standards for traffic circulation and pedestrian and bicycle safety for the project-specific analysis would be determined by the appropriate jurisdiction for each roadway and intersection facility (i.e., County of Santa Cruz, Town of Aptos, and Caltrans).

The following discusses a programmatic approach to the potential traffic, circulation, and parking impacts that project implementation may cause.

Impact Trans-1. Potential Traffic Circulation Impacts

Implementation of the proposed General Plan may result in an increase in public use and an associated increase in vehicle trips to the Park. The potential forecast generation of increased traffic during the weekday peak commute hours and the peak weekend hour may impact the local and regional circulation networks in the project vicinity. The addition of park related traffic may worsen current and forecast peak hour levels of service at local roadways and intersections (see Table 7, Existing Daily Traffic Volumes on Roadways in the Study Area). In addition, an increase in park related traffic may impact other local roadways and adjacent land uses that would be used to access park entrance roadways. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Trans-1. Potential traffic circulation impacts will be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Provide multiple access point into the Park to minimize the concentration of users and correlated traffic and circulation impacts.
- Install adequate signage on roads and trails as needed to easily orient and focus visitors arriving at and traveling within the Park.
- Design regional trail connections and access to minimize the concentration of users at a limited number of park access points and trailheads.

- Coordinate with local, regional, and state agencies to provide easy to read signs on highways and local roads that clearly direct visitors to the Park entrance(s) and parking facilities.
- Develop additional parking to meet the estimated demand and decrease traffic and circulation conflicts to the adjacent residential neighborhoods.
- Cooperate with local, regional and state jurisdictions to facilitate anticipated traffic and circulation improvements in the local area (Aptos Planning Area), as discussed in the 1994 County of Santa Cruz General Plan and Local Coastal Plan.
- Develop a circulation system that does not create traffic conflicts. Consider separate travelways where necessary to improve safety and minimize traffic conflicts.
- Promote carpool, vanpool, and regional transit transportation options to park facilities by providing public information on alternative transportation options and designated parking for carpools, vanpools, and buses.
- Consider level of service (LOS) calculations on appropriate access roads as part of any project potentially impacting traffic or circulation, utilizing the most current Highway Capacity Manual Operations Methodology for all existing LOS analysis, or the currently accepted interim methodology until appropriate guidelines are adopted.
- Concurrent with planning and development of project level facilities and management plans, evaluate project's potential to affect traffic and circulation. This may include a traffic and circulation study that address one or more of the following: 1) project trip generation analysis; 2) roadway, intersection and freeway operations and level of service analyses; 3) parking demand analysis; 4) development of appropriate project-specific mitigation measures to reduce potential impacts; or 5) an on-site traffic, circulation, and access study. Project-specific mitigation would be developed, based on the results of these studies.

Implementation of mitigation measures, as described above, would reduce the potential program-level traffic circulation impacts associated with the implementation of the General Plan. However, the Department would require examination of specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Trans-2. Potential Pedestrian and Bicycle Safety Impacts

Implementation of the proposed General Plan may result in new secondary access points to the Park. The location and design of these access points has the potential to result in safety hazards for the motorist and pedestrian. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not

yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Trans-2. Potential pedestrian and bicycle safety impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan. Mitigation measures shall be implemented, as appropriate, including but not limited to:

- Locate and design the potential secondary access points to avoid or minimize potentially significant pedestrian, bicycle, and automobile safety hazards.
- Consider separate travelways where necessary to improve safety and minimize traffic conflicts.
- Install adequate signage on roads and trails to quickly orient and focus visitors walking and bicycling through the Park; also to advise motorists of the presence of pedestrians and bicyclists .
- Concurrent with planning and development of project level facilities and management plans, evaluate the project's potential to affect bicycle and pedestrian traffic and circulation. Project-specific mitigations would be developed, based on the results of these studies.

Implementation of the mitigation measures described above would reduce potential program-level pedestrian and bicycle safety impacts associated with the implementation of the General Plan. However, the Department would require examination of specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Impact Trans-3. Potential Parking Impacts

Implementation of the proposed General Plan may result in several new parking areas that will provide additional parking for visitors. However, the potential mix and types of land uses that could occur in the Park, as a result of General Plan implementation, might generate parking demand beyond the parking supply currently envisioned. This potential unmet parking demand may lead to hazardous pedestrian and traffic conditions as vehicles circulate in crowded parking lots, or park in unauthorized areas. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans will be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Trans-3. Potential parking impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Promote carpool, vanpool, and regional transit transportation options to park facilities by providing public information on alternative transportation options and designated parking for carpools, vanpools, and buses.
- Provide additional parking to respond to the estimated demand and to decrease traffic and circulation conflicts in the adjacent residential neighborhoods.
- During development of project level facilities and management plans, parking demand and adequacy of existing facilities should be considered, if appropriate. Following completion of the parking demand study, recommended mitigation will be considered to minimize potential impacts to parking.

Implementation of the mitigation measures described above would reduce the potential program-level parking impacts associated with the implementation of the General Plan. However, the Department would require examination of specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Utilities and Public Services

Threshold

Increase in demand for utilities or public services associated with implementation of the General Plan would not in itself be considered a significant environmental impact. However, if such demand were to result in the expansion of existing facilities or construction of new facilities, and if construction or operation of these expanded or new facilities were to result in a significant effect on the physical environment, implementation of the General Plan could be considered to have a significant impact on utilities or public services.

Potential Impacts and Mitigation Measures

Potential impacts associated with the need for and operation of storm water facilities is discussed under the section entitled “Water Quality and Hydrology.” Potential impacts associated with construction of any new storm water facilities required as part of Plan implementation are addressed in the discussions related to construction phase impacts.

Impact Util-1. Potential Fire Protection Services Impacts

The adequacy of fire protection for a given area is based on required fire-flow (the optimum or standard amount of water flow required for a theoretical fire at a specific location, or how much water can be delivered by one or more hydrants to fight a fire at a specific location), response distance from existing fire stations, and the Fire Department’s judgment for needs in the area. In general, the required fire-flow is closely related to land use. The quantity of water necessary for fire protection varies with the type of development, life hazard, occupancy and the degree of fire hazard.

Implementation of the proposed General Plan may result in increased visitation to the Park, which, in turn, would increase the probability of fires caused by human activity. Full implementation of the Plan could result in some increases in demand for fire protection services, but overall these increases would be minimal. However, potential fire protection services impacts could occur if new facilities are not designed properly and proper access and water flow is not provided.

Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Util-1. Potential fire protection services impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- The Department shall comply with all applicable State and local codes and ordinances. Requirements may relate to automatic fire extinguishing systems and smoke detectors, availability of fire-fighting support equipment, and appropriate notification procedures.
- Roofs of new structures shall have a Class A rating to mitigate wildfire problems that may arise as a result of grassland-urban interface. Roof design, construction, and material shall conform to the Uniform Building Code.
- Requirements for emergency vehicle access shall be incorporated into project design, including access to physical structures and fire hydrants. Such requirements include road grade and lane width, paving of access roads, curb painting, emergency breakaway gates, vertical clearance, turning radii, turn-around areas, and signage. All appropriate emergency access shall be maintained.
- Water flow requirements and fire hydrant specifications shall be met. All fire hydrants shall be in place prior to the construction of any facilities.
- Emergency vehicle access shall be maintained at all times.

Implementation of the requirements described above would reduce the potential program-level fire protection services impacts associated with the implementation of the General Plan. However, the Department would require examination of specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Water Quality and Hydrology

Threshold

A significant water quality and/or hydrology impact would be expected to occur if the project would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there should be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems.
- Otherwise substantially degrade water quality.
- Place structures that would impede or redirect flood flows within a 100-year flood hazard area.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Potential Impacts and Mitigation Measures

Impact Water-1. Potential Runoff and Downstream Flooding Impacts

Implementation of the General Plan would result in the addition of new facilities, such as a visitor center, and education facility, additional parking, and a car accessible campground,. If implemented, the facilities may result in increased impervious surfaces, such as sidewalks, parking lots, roads, rooftops, and compacted soil that would increase runoff. Storm water runoff is influenced by rainfall intensity, ground surface permeability, watershed size and shape, and physical barriers. The introduction of impermeable surfaces greatly reduces natural infiltration, allowing for a greater volume of runoff. In addition, paved surfaces and drainage conduits can accelerate the velocity of runoff, concentrating peak flows in downstream areas faster than under natural conditions. Significant increases to runoff and peak flows can overwhelm drainage systems and alter flood elevations in downstream

locations. Finally, increased runoff velocity can promote scouring of existing drainage facilities, reducing system reliability and safety. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Water-1. Potential runoff and downstream flooding impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Use of DPR and/or RWQCB approved BMPs during construction phase of project.
- If necessary, Park improvements shall include upgrading of storm water drainage facilities to accommodate increased runoff volumes. These upgrades may include the construction of detention basins or structures that will delay peak flows and reduce velocity. System designs shall evaluate and incorporate, where feasible, methods to eliminate increases in peak flow rates from current levels.
- Use of permeable surfaces where possible.
- A drainage plan shall be included with grading plan applications. Drainage systems shall be designed to maximize the use of detention basins, vegetated areas, and velocity dissipaters to reduce peak flows where possible.

Implementation of storm drainage measures, as described above, would reduce the program level potential runoff and downstream flooding impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than Significant at the Program-level

Impact Water-2. Potential Water Quality Impacts

Implementation of the proposed General Plan would result in the addition of new facilities and increased public use. Increased development can increase the erosion potential of the area. Development can increase pollutant loads in runoff from construction activities, landscape irrigation, storm water, and illicit dumping. Pollutants of concern include sediment, nutrients, bacteria and viruses, oxygen demanding substances, oil and grease, metals, pesticides, and trash. Public parks are known to contribute substantial amounts of trash and pollutants associated with parking lots. Paved surfaces, parking lots, and gutter designs promote the collection and concentration of pollutants. Overuse by park visitors can destroy vegetation and increase sediment loads to receiving water bodies. In addition, construction activities would increase the potential for spills of hazardous materials and would expose soils to wind and rain erosion. Source control measures for new developments

will assist in reducing pollution of the watershed. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Water-2. Potential water quality impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Use DPR and/or RWQCB BMPs for erosion and sedimentation control during the construction phase.
- As necessary, new facilities shall include water quality control features such as detention basins and vegetated buffers, to prevent pollution of adjacent water resources by runoff. Wherever feasible, detention basins shall be equipped with oil and grease traps and will be cleaned regularly.
- All new projects, rehabilitated facilities, and increased visitor use in the Park will be evaluated to ensure that they do not contribute to the degradation of water quality. Any accelerated erosion, sedimentation, and habitat degradation will be identified and reduced or eliminated to the extent feasible.
- Erosion control practices should be used near surface waters for all activities that disturb the ground surface.
- Parking lots shall be equipped with runoff treatment systems in compliance with Standard Urban Storm Water Mitigation Plan regulations.
- Storm water drainage systems shall be equipped to collect the anticipated increases in trash loads. The systems shall assist in reducing the Park's trash contribution to local creeks from existing levels.
- Operational best management practices for street cleaning, litter control, and catch basin cleaning shall be routinely implemented to prevent water quality degradation.
- Design recreation facilities to minimize water quality impacts by avoiding disturbance to or protecting steep slopes, highly erodible soils, and riparian and wetland areas.
- Develop ongoing programs of trail maintenance and watershed restoration for areas disturbed by recreational use.
- Management Plans referenced in this General Plan will incorporate actions necessary to protect and restore natural resources, including habitat and species populations. This may include the temporary closure, remodeling, or relocation of campgrounds and other facilities to allow the recovery of compacted soils and natural vegetation.

- Storm Water Pollution Prevention Plans shall be submitted to the Regional Water Quality Control Board as necessary, prior to the commencement of construction activities. Plan requirements, including on-site soil and dust control Best Management Practices, shall be implemented to minimize construction site erosion. Best Management Practices shall be established and implemented in compliance with any local storm water ordinance.
- If necessary, a Pesticide Management Plan shall be developed and implemented to regulate the storage and application of pesticides to protect water quality.

Implementation of the features, systems, and practices described above would reduce the potential program-level water quality impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Impact Water-3. Potential Wetlands Impacts

Portions of the Park could be designated as waters of the United States subject to jurisdiction under Section 404 of the Clean Water Act (CWA), for example meadows and streams. Implementation of the proposed General Plan would result in the addition of new facilities (such as roads, trails, campgrounds, parking, and structures) that may necessitate the placement of fill near these areas. The General Plan indicates that new facilities will avoid wetland areas. Because implementation information, such as locations of specific facilities and development of project-specific management plans, is not yet known, specific facilities and plans would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures.

Mitigation Measure Water-3. Potential wetlands impacts should be reviewed at the project-level for specific facilities or management plans proposed under the General Plan and mitigation measures shall be implemented, as appropriate, including but not limited to:

- Prior to development, a survey shall be conducted to determine whether there are potential wetlands that would be affected by project implementation. If wetlands are identified, site and design facilities to avoid or reduce adverse effects to wetlands. If avoidance is infeasible, minimize and compensate adverse effects to wetlands in accordance with Section 404 of the Clean Water Act and other applicable wetland protection regulations.
- Develop and implement wetland restoration and/or monitoring plans as warranted. Plans should include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.
- As necessary, acquire necessary permits and/or approvals for activities that may effect wetlands or water-associated habitats. Permits could include a Section 404 Clean

Water Act permit from the U.S. Army Corps of Engineers, Streambed Alteration Agreement from the California Department of Fish and Game, and water quality certification or waiver from the Regional Water Quality Control Board.

Implementation of compliance measure, as described above, would reduce the potential program-level wetlands impacts associated with the implementation of the General Plan. However, the Department would require examination of many specific facilities and management plans included in the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Significance After Mitigation: Less than significant at the Program-level

Mitigation Measures Proposed to Minimize Significant Effects

To ensure that implementation of the General Plan protects resources and visitor experience, a consistent set of mitigation measures will be applied to actions that result from or are guided by the Plan. The Department will prepare appropriate environmental review (i.e., CEQA, the National Historic Preservation Act, and other relevant legislation) for these future actions. As part of the environmental review, the Department will avoid, minimize, and mitigate adverse impacts when practicable.

Unavoidable Significant Environmental Effects

Implementation of the General Plan would not result in unavoidable significant environmental effects.

Significant Irreversible Environmental Changes

Implementation of the proposed General Plan would apply management zoning to the Park which would allow construction of new facilities that in turn could result in short-term, construction-related impacts, impacts from increased operations and maintenance activities, and impacts associated with increased public access and use. These potential impacts are identified in the section above entitled “Significant Environmental Effects and Mitigation Measures.” With the adoption of the Plan and the mitigation measures identified above, implementation of anticipated projects would not result in significant irreversible environmental impacts or commitment of resources. However, the commitment of land, resources, and energy for maintenance of the project facilities would be a long-term commitment.

Growth-inducing Impacts

Growth-inducing effects are defined as those effects that could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth-inducing effects could result from projects that would remove obstacles to population growth. Increases in population could tax existing community

service facilities, requiring construction of new facilities that could cause significant environmental effects.

If implemented completely, the General Plan may indirectly foster minimal economic and population growth in the region. With complete development of all proposals, Park visitation is likely to increase, due to an increased interpretive potential at the visitor and education center, and the development of a vehicular accessible campground as well as additional parking.

Any improvement or increase in capacity can encourage increased use, which may create additional tourism and the need for tourist services in the adjacent communities and surrounding region. The proposals in the General Plan may potentially foster economic growth in the region by encouraging an increase in supporting recreation and tourist services, such as recreation equipment, supplies, food, and related facilities. The increase in visitor use may be considered an economic benefit to the surrounding communities.

The proposed visitor and education center developments may result in the need for an increased number of permanent and seasonal staff, which may necessitate staff housing outside the Park boundaries. These proposals may result in a very minimal growth impact to the area.

Sustainable Design

Projects should avoid or minimize adverse impacts to natural and cultural resources. Development projects (e.g., buildings, facilities, utilities, roads, bridges, trails, etc.) or reconstruction projects (e.g., road reconstruction, building rehabilitation, utility upgrade, etc.) should be designed to work in harmony with the surroundings. Projects should reduce, minimize, or eliminate air and water nonpoint-source pollution. Projects should be sustainable whenever practicable, by recycling and reusing materials, by minimizing materials, by minimizing energy consumption during the project, and by minimizing energy consumption throughout the lifespan of the project.

Alternatives to the Proposed Action

Overview

This section identifies alternatives to the proposed General Plan and discusses environmental impacts associated with each alternative. The California Environmental Quality Act (CEQA) Guidelines Section 15126.6(a) require EIRs to describe a range of reasonable alternatives to a project or its location that would attain the basic objectives of the project, but would avoid or reduce significant effects of the project, and to evaluate the comparative merits of the alternatives. The Guidelines set forth the following criteria for selecting alternatives:

- . . . [T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. (§15126.6[b])

- The range of potential alternatives shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. (§15126.6[c])
- The specific alternative of “no project” shall also be evaluated along with its impact. (§15126.6[e][1])
- The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making. (§15126.6[f])

Three alternatives other than Alternative B, the preferred alternative (Figure 8), were considered prior to developing the proposed General Plan:

- No Project
- Alternative A
- Alternative C

Alternative B is presented as the preferred alternative in the Plan portion of this document. Table 10 presents a summary overview of the alternatives.

TABLE 10 SUMMARY OVERVIEW OF ALTERNATIVES			
NO ACTION	ALTERNATIVE A	ALTERNATIVE B (PREFERRED PLAN)	ALTERNATIVE C
Unit Vision			
None applied	As presented in The Plan section of this document	Same as Alternative A	Same as Alternative A
Unit Classification			
As presented in The Plan section of this document	Same as No Action	Same as No Action	Same as No Action
Unitwide Goals and Guidelines			
None applied	As presented in The Plan section of this document	Same as Alternative A	Same as Alternative A
Area Specific Goals and Guidelines			
None applied	As presented in The Plan section of this document	Same as Alternative A	Same as Alternative A

TABLE 10
SUMMARY OVERVIEW OF ALTERNATIVES

NO ACTION	ALTERNATIVE A	ALTERNATIVE B (PREFERRED PLAN)	ALTERNATIVE C
Management Zoning and Allowable Use Intensities			
None applied	Applied	Applied	Applied
Wilderness (low allowable use intensity)			
None applied	Upper portion of park	None applied	None applied
Resource Protection and Recreation (Low allowable use intensity)			
None applied	None applied	Upper portion of park	Upper portion of park (less than Alternative B)
Resource Protection and Recreation (Medium allowable use intensity)			
None applied	Central portion of park	Central portion of park (more than Alternative A)	Central and upper portion of park (more than Alternative B)
Resource Protection and More Intensive Recreation (High allowable use intensity)			
None applied	Lower portion of park (below Porter Family Picnic Area)	Same as Alternative A	Same as Alternative A
Identified Potential Future Actions			
None identified	Identified	Identified	Identified
Visitor Center			
No change	Potential visitor center in lower portion of park	Same as Alternative A	Same as Alternative A
Parking			
No change	Potential new or additional parking at the Hinkley entrance, northeast entrance, Porter Family Picnic Area, Visitor Center, and dedication tree	Same as Alternative A	Same as Alternative A
Trail Camp			
No change	Relocate trail camp east of current location	Same as Alternative A	Same as Alternative A
Car Campground			
No change	No change	Potential new car accessible campground in lower portion of park	Same as Alternative B
Aptos Creek Road			
No change	Upper portion within designated wilderness converted to trail use only	No change	No change

TABLE 10
SUMMARY OVERVIEW OF ALTERNATIVES

NO ACTION	ALTERNATIVE A	ALTERNATIVE B (PREFERRED PLAN)	ALTERNATIVE C
Mountain Bike Use			
No change	Not allowed within designated wilderness	Potential addition of shared use on new entrance trail	Potential addition of shared use on new entrance loop trail and West Ridge Trail
Education Facility			
No change	Potential education facility developed in conjunction with Cabrillo College	Same as Alternative A	Same as Alternative A
All Weather Trail Bridge			
No change	No change	Potential all weather trail bridge in lower portion of the park	Same as Alternative B
Interpretation			
No change	New interpretation signage and information throughout the park	Same as Alternative A	Same as Alternative A

No Project Alternative

Description of Alternative

If a general plan is not implemented for The Forest of Nisene Marks State Park the existing situation will continue for park development, operation, and management. Development of the Park would be restricted to projects that:

- repair, replace, or rehabilitate an existing facility;
- provide a temporary facility, so long as the construction does not result in the permanent commitment of resources;
- are necessary for the protection of public health and safety; or
- provide emergency measures necessary for the immediate protection of a natural or cultural resource [Public Resources Code 5002.2(c)].

This alternative would allow the existing the Park to function, but would not achieve any of the improvement goals of this General Plan.

Impacts and Reasons for Rejection

The existing conditions and limitations would continue if the General Plan were not adopted. The No Project Alternative would make it difficult for the Department to seek funds for recreational and interpretive improvements that could enhance resource protection and the visitor experience at the Park's current level of use, and that could be necessary to accommodate projected increases in visitor demand in the future. Land use planning and management may not be coordinated park-wide under the No Project Alternative. The No Project Alternative would not achieve the primary goal of the General Plan which is to enhance recreational opportunities and protect resources.

Alternative A

Description of Alternative

Alternative A (Figure 7) would apply three management zones to the Park. The upper portion of the Park would be designated as wilderness (low allowable use intensity), the central portion as resource protection and moderate recreation (moderate allowable use intensity), and the lower portion of the Park, below the Porter Family Picnic Area, as resource protection and more intensive recreation (high allowable use intensity). The wilderness designation would prohibit mechanized travel as well as mountain bike use. As such, the portion of Aptos Creek Road occurring within designated wilderness would be decommissioned and converted to a trail. Identified potential future actions would be the same as identified in The Plan section of this document for the preferred alternative with the following exceptions:

- No new car accessible campground is identified; and,
- No new all weather trail bridge is identified.

Potential Impacts and Reasons for Rejection

Alternative A would designate a significant portion of the Park as wilderness. This designation would eliminate mechanized travel in this area which would therefore inhibit fire protection and emergency response services in this portion of the Park. The wilderness designation would also prohibit mountain bike use and other types of active, mechanized recreation in this area. Alternative A would feasibly attain most of the basic project objectives. Implementation of actions and mitigation measures similar to those included in the proposed General Plan would likely reduce most impacts to a less than significant level. Potentially significant impacts of the proposed project may be substantially lessened due to the wilderness designation and resulting low intensity visitor use in this area. One exception where identified mitigation may be insufficient would be fire protection and emergency services. Alternative A would provide resource protection; however, this alternative decreases the diversity and range of recreation opportunities park-wide. It does not respond to the increasing recreation demand and diversity in the region.

Alternative C

Description of Alternative

Alternative C (Figure 9) would apply three management zones to the Park. The upper portion of the Park would be managed for resource protection and low intensity recreation, the central portion for resource protection and moderate recreation (moderate allowable use intensity), and the lower portion of the Park, below the Porter Family Picnic Area, would be managed for resource protection and more intensive recreation (high allowable use intensity).

Although similar to the preferred alternative, Alternative C would designate more land for resource protection and moderate intensity recreation and a lesser amount of Park land managed for low intensity recreation. Two shared use trails, an entrance loop trail and the West Ridge Trail, would be considered in this alternative.

Potential Impacts and Reasons for Rejection

Alternative C would create a substantial area of the Park that would be managed for resource protection and moderate intensity recreation use.

Providing a quiet, relatively undeveloped experience of nature is inherent in the vision and goals of this park. In Alternative C a greater amount of the Park would be used for moderate intensity recreation, thus providing fewer opportunities for a more natural wilderness experience for the Park visitor. Providing a larger area of the Park for moderate intensity recreation opportunities may also result in additional impacts and necessary mitigation to natural and cultural resources, including impacts to native plant communities, wildlife habitat, wildlife corridors, and water quality. The consideration and development of the two proposed shared use trails would be consistent with all Department policies for shared, or multi-use, trails.

Implementation of actions and mitigation measures similar to those included in the proposed General Plan would likely reduce most impacts to a less than significant level.

Cumulative Impacts

Cumulative environmental effects are multiple individual effects that, when considered together are considerable or that compound or increase other environmental impacts. The individual effects may result from a single project or a number of separate projects and may occur at the same place and point in time or at different locations and over extended periods of time. Cumulative impacts can result from individually minor but collectively significant projects.

The purpose of this cumulative analysis is to determine whether potentially significant cumulative environmental impacts would occur from implementation of the General Plan in combination with other projects or conditions, and to indicate the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in

connection with the effects of past, current, and probable future projects. The discussion of cumulative impacts should include:

- (1) Either: (A), a list of past, present, and probable future projects producing related or cumulative impacts; or (B), a summary of projections contained in an adopted General Plan or similar document, or in an adopted or certified environmental document, which described or evaluated conditions contributing to a cumulative impact;
- (2) A discussion of the geographic scope of the area affected by the cumulative effect;
- (3) A summary of expected environmental effects to be produced by these projects; and,
- (4) Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The proposed General Plan would result in new or expanded facilities. The project-level implementation schedule for envisioned facilities at the Park is not known at this time; therefore, a definitive list of specific cumulative projects for The Forest of Nisene Marks State Park cannot be prepared. Generally, cumulative projects would include development and construction projects within adjacent unincorporated Santa Cruz County and the Town of Aptos. Cumulative projects could include on-going infill of residential, commercial, and industrial properties, as well as continuing development of recreation and public areas in the vicinity of the Park. In addition, regional development could be considered cumulatively with implementation of the General Plan, where such development relates to regional traffic and transportation, air quality, and habitat conservation; such effects could be cumulatively considerable.

Because specific plans timelines for implementation of facilities that could be developed under the General Plan are not known and many of the projects within the adjacent jurisdictions are not fully developed or designed, assessing the expected environmental effects that these projects would produce entails speculation. However, there are two general categories of effects that could be expected. The first and most widespread would be general construction impacts, such as temporary air quality degradation and increased erosion resulting from earth movement. However, construction impacts would be temporary and local in nature and thus unlikely to constitute cumulatively considerable contributions to cumulative significant impacts. The second category of impacts is related to operational effects to regional traffic, air quality, and potential habitat alterations and effects on wildlife.

Implementation of the General Plan, in conjunction with other regional projects and ongoing regular park maintenance activities, could adversely affect resources within the Park. However, implementation of mitigations described in this document would reduce any impacts, including cumulative impacts, to a less than significant level at the program-level. The Department would require examination of any specific facilities and Management Plans allowed under the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level is necessary, including analysis of potential cumulative effects.

Effects Found not to be Significant

Biological Resources

Impacts to Common Vegetation and Species

Implementation of the proposed General Plan would increase development and visitor use. Construction and operations could adversely affect common vegetation communities and plant and wildlife species, for example elimination of small portions of non-native annual grassland, and the mortality of common wildlife species. These potential affects would be considered adverse, but less-than-significant.

Hazards and Hazardous Materials

Increase in Public Access and Use

Implementation of the proposed General Plan may result in increased public use of the Park. Greater human presence and accessibility to remote areas of the Park could increase the likelihood of illegal dumping of wastes, including hazardous wastes. However, this potential generally exists in all wildlands and open space preserves and would not be considered a substantial threat to the public or the Park. Therefore, potential increases in illegal dumping of wastes would not be a significant impact.

Land Use

Disruption of Established Communities

Implementation of the proposed General Plan would apply management zoning to the Park that could increase public access into portions of the Park. The intention of the General Plan is to provide for the continuation of existing uses on public trails, and access sites, and to provide for the establishment of some new public use opportunities, such as a visitor center, trails, interpretive programs and panels, etc. (see the section entitled “The Plan”). In addition, the General Plan calls for provision of universal access to recreation facilities and trails, which could increase public use of the Park. New trails would be restricted to areas of low vulnerability and risk in order to protect water quality and sensitive ecological resources. The General Plan would give priority to trails that provide connections to urban areas and trails of other agencies. These trails would allow for general public access.

When evaluated in terms of the significance criteria outlined in the section entitled “Significant Environmental Effects and Mitigation Measures” potential increases in public use would not disrupt or divide the physical arrangement of established surrounding uses. Areas adjacent to the Park are developed primarily with residential, educational, and recreational uses, and the proposed increased recreational uses would be compatible with such uses and would not significantly disrupt the existing land use patterns. Proposed trails would connect with existing trails and would not alter the land use character in the vicinity. Therefore, implementation of the General Plan would not directly result in any significant land use impacts.

The Department would require examination of any specific plan actions allowed under the General Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary.

Conflict with Established Recreational, Educational, Religious, or Scientific Uses

Implementation of the General Plan would not substantially conflict with established recreational, educational, religious, or scientific uses. The General Plan would continue existing education and interpretation and would increase such opportunities by providing new visitor centers, interpretive panels, a plant nursery, and other educational or scientific opportunities. The Plan would improve recreational opportunities and would not affect any casual use of the Park for religious activities.

Impacts on the Existing Character of the Vicinity

Implementation of the General Plan is intended to continue use of the Park as a public use area. Implementation of the Plan would not affect the existing land use character of the site.

Agricultural Resources Impacts

The proposed General Plan would be implemented on Department-owned land. The potential facilities and improvements included in the Plan are consistent with and would not change the existing land use of the Park. The Forest of Nisene Marks State Park is not included in the California Resources Agency Farmland Mapping and Monitoring Program and there are no agricultural resources located within the Park. The proposed Plan would have no effect on agricultural resources.

Mineral Resources Impacts

While oil exploration within the Park has occurred previously, oil production does not currently occur within the Park. Implementation of the General Plan would not affect oil production or mineral resources.

Utilities and Public Services

Implementation of General Plan management actions would generally not require expansion or improvement of utilities and public services. Implementation of the proposed General Plan could require expansion of existing utilities, water supply, or sewage systems. However, the system expansions required for individual actions are expected to be minimal, and construction and operation of expansions would not likely result in significant effects on the physical environment, beyond those discussed for implementation of the General Plan as a whole (see the section entitled “Significant Environmental Effects and Mitigation Measures.”). Overall, the General Plan is beneficial to public service and utility systems, as it will result in efficiency improvements to these systems.

Wastewater Treatment Services

A small increase in demand for wastewater treatment may occur due to increased use of the Park. However, this increase would not exceed the local wastewater treatment requirements. Therefore, there would be no significant impact to wastewater treatment services.

Water Supply

Demand for water in the Park could increase due to increased visitation and use of the Park, although the amount of this increase is currently unknown. The water demand associated with recreational land uses is generally lower than residential land uses. Moreover, the General Plan includes water conservation elements. For instance, the Plan stipulates that reclaimed water is used for irrigation and non-drinking water uses. This includes use of reclaimed water or storm water captured on-site for all irrigation and other non-potable water uses as possible.

Because the increase in water demand related to implementation of the General Plan would be minimal and the General Plan incorporates water conservation elements, there would be a less than significant impact on water supply resources.

Solid Waste Disposal

Increased use of the Park would generate additional solid waste but the increase is relatively small compared to total landfill capacity serving the region. Landfills serving the local area would easily accommodate the Park's solid waste disposal needs. The General Plan complies with federal, state, and local statutes and regulations related to solid waste. As part of its mandate to maximize the long-term sustainability of park resources, the General Plan includes recycling of green waste and recycling of other recyclable products. The Plan indicates that all park facilities, gardens, landscaped areas, picnic areas, parking lots, buildings and other visitor-serving uses should be equipped with recycling and trash bins. Therefore, the General Plan would not result in significant solid waste disposal facilities impacts.

Police Protection Services

The General Plan states that public safety services shall be coordinated to provide cooperation between State Park rangers and all jurisdictions serving the Park, and includes management actions for providing additional protection and safety services that meet the demands of increased use and activity in the Park. Private vehicles would not have road access throughout the Park, preventing many types of potential safety issues. Because the General Plan addresses the need for additional public safety facilities and service, there would be no significant impact on police services.

Schools

Implementation of the General Plan would not significantly increase population growth, or the direct need for additional schools in the nearby school districts. Therefore, there would not significant impact on public schools systems. Further, the Plan includes several educational opportunities that could provide beneficial resources to local schools.

Water Quality and Hydrology

Groundwater Impacts

Implementation of the proposed General Plan would result in the installation of buildings, parking lots, bike paths, and roadways. If constructed, these facilities are not expected to significantly affect groundwater recharge at the site. Although increased impervious surfaces could accelerate peak runoff, no impacts to groundwater recharge would be expected.

100-year Flood plain Impacts

The Park is not located within a designated 100-year flood plain.

List of Preparers

This General Plan and Environmental Impact Report is a product of the efforts of the planning and environmental consultants and Departmental staff, but reflects the independent review, analysis and judgement of DPR as the lead agency. Table 11 identifies individuals responsible for preparing this General Plan and Environmental Impact Report.

TABLE 11		
LIST OF PREPARERS		
NAME	TITLE	RESPONSIBILITY
California Department of Parks and Recreation		
<i>Lead Agency, General Plan Development</i>		
Dave Vincent	District Superintendent	Project Oversight
Ralph Fairfield	Chief Ranger – Coastal Sector	Project Manager
David Keck	Supervisor, General Planning, Northern Service Center	General Planning Coordination
Ellen Wagner	Associate Park and Recreation Specialist	CEQA Coordination, Environmental Impact Report Review
Shaelyn Raab Strattan	Associate Park and Recreation Specialist	Environmental Impact Report Review
Royston, Hannamoto, Alley, and Abey		
<i>General Plan Consultant</i>		
Doug Nelson	Principal, Landscape Architect	Project Director for the General Plan
Cordelia Hill	Principal, Landscape Architect	Assisting Director for the General Plan
Brooke Valen	Project Manager	Project Manager for the General Plan
Environmental Science Associates		
<i>General Plan Subconsultant</i>		
Tom Roberts	Director of Biological Services	Project Director for the Environmental Impact Report
Nancy Barbic	Director of Land Management Services	Project Manager for the Environmental Impact Report

TABLE 11
LIST OF PREPARERS

NAME	TITLE	RESPONSIBILITY
Tay Gerstell	Senior Wildlife Biologist	Animal Life Aquatic Life Special Status Species
Peter Hudson, RGE	Senior Geologist and Hydrologist	Hydrology, Floodplains and Water Quality Geology, Geohazards, and Soils Hazards and Hazardous Materials
Austin Kerr	Associate	Air Quality Noise
Martha Lowe	Senior Wildlife Biologist	Plant Life Special Status Species
Paul Mitchell	Senior Transportation Specialists	Transportation and Circulation
Alisa Moore	Senior Associate	Aesthetics Recreation
Albion Environmental		
<i>General Plan Subconsultant</i>		
Clinton Blount	Principal and Anthropologist	Cultural Resources
Sandy Lydon	Independent Consultant	Cultural Resources
Beneficial Designs		
<i>General Plan Subconsultant</i>		
Kathleen Mispagel	Project Coordinator	Universal Access

Comments Received on the Preliminary General Plan and Draft EIR

Responses to comments received regarding the Preliminary General Plan and Draft EIR will be provided following completion of the public review period for this document.

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Tables

TABLE 1
WATER QUALITY ANALYSES PERFORMED
ON APTOS CREEK

Data Collected	Water Sample Results	Water Quality Objectives
May-June 1999	Dissolved Oxygen: 3.5-10.0 mg/L Turbidity: 0-5 JTU Conductivity: 0.6-0.7 mS pH: 8	Dissolved Oxygen: >5.0 mg/L Turbidity: NA Conductivity: 0.3-1.5 mS pH: 7.0-8.5
July-September 1999	Dissolved Oxygen: 6.5-10.2 mg/L Turbidity: 0-5 JTU Conductivity: 0.2-0.8 mS pH: 7.5-8	Dissolved Oxygen: >5.0 mg/L Turbidity: NA Conductivity: 0.3-1.5 mS pH: 7.0-8.5
October-December 1999	Dissolved Oxygen: 9.6-11.4 mg/L Turbidity: 0-10 JTU Conductivity: 0.6-1 mS pH: 8	Dissolved Oxygen: >5.0 mg/L Turbidity: NA Conductivity: 0.3-1.5 mS pH: 7.0-8.5
January- March 200	Dissolved Oxygen: 7.6-13.6 mg/L Turbidity: 0-20 JTU Conductivity: 0.3-0.8 mS pH: 8	Dissolved Oxygen: >5.0 mg/L Turbidity: NA Conductivity: 0.3-1.5 mS pH: 7.0-8.5
April-June 2000	Dissolved Oxygen: 8.5-11.2 mg/L Turbidity: 0 JTU Conductivity: 0.4-0.8 mS pH: 7.5-8	Dissolved Oxygen: >5.0 mg/L Turbidity: NA Conductivity: 0.3-1.5 mS pH: 7.0-8.5
July-September 2000	Dissolved Oxygen: 9.1-9.9 mg/L Turbidity: 0 JTU Conductivity: 0.8-0.9 mS pH: 7.5-8	Dissolved Oxygen: >5.0 mg/L Turbidity: NA Conductivity: 0.3-1.5 mS pH: 7.0-8.5
October-December 200	Dissolved Oxygen: 9.8-13.2 mg/L Turbidity: 0 JTU Conductivity: 0.9-1 mS pH: 7.8-8.5	Dissolved Oxygen: >5.0 mg/L Turbidity: NA Conductivity: 0.3-1.5 mS pH: 7.0-8.5

January-February 2001	Dissolved Oxygen: 109-12.3 mg/L	Dissolved Oxygen: >5.0 mg/L
	Turbidity: 0-10 JTU	Turbidity: NA
	Conductivity: 0.5-0.9 mS	Conductivity: 0.3-1.5 mS
	pH: 8	pH: 7.0-8.5
April-June 2001	Dissolved Oxygen: 10.3-10.5 mg/L	Dissolved Oxygen: >5.0 mg/L
	Turbidity: 0 JTU	Turbidity: NA
	Conductivity: 0.8-0.9 mS	Conductivity: 0.3-1.5 mS
	pH: 8-8.5	pH: 7.0-8.5
July-August 2001	Dissolved Oxygen: 9.9-21.0 mg/L	Dissolved Oxygen: >5.0 mg/L
	Turbidity: 0 JTU	Turbidity: NA
	Conductivity: 0.9 mS	Conductivity: 0.3-1.5 mS
	pH: 8	pH: 7.0-8.5

Notes:

mg/L	Micrograms per Liter
JTU	Jackson Turbidity Unit
mS	Millisiemens
NA	Not Available

SOURCE: Coastal Watershed Council, 2001, Regional Water Quality Control Board, Region 3, 1994 *Water Quality Control Plan*.

TABLE 2
ACTIVE FAULTS IN THE VICINITY OF
THE FOREST OF NISENE MARKS STATE PARK

Fault	Distance and Direction from the Park	Recency of Movement	Fault Classification ^a	Historical Seismicity ^b	Maximum Moment Magnitude Earthquake (Mw) ^c
San Andreas (Santa Cruz Segment)	0 miles west	Historic (1989 ruptures)	Active	M7.1, 1989 Many <M6.0	6.9
San Gregorio	2.5 miles southeast	Holocene	Active Segments	Epicenters Plotted M5.5-5.9 1869-1931	7.5
Zayante	Bisects the Park	Quaternary	Possible active, potentially active segments	Not Expected	6.8

- a An active fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. "Sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).
- b Richter magnitude (M) and year for recent and/or large events. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave.
- c Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Moment magnitude provides a physically meaningful measure of the size of a faulting event (California Division of Mines and Geology, 1997). The Maximum Moment Magnitude Earthquake (Mw), derived from the joint CDMG/USGS Probabilistic Seismic Hazard Assessment for the State of California, 1996. (CDMG OFR 96-08 and USGS OFR 96-706).

SOURCES: Hart, 1997; Jennings 1994; Peterson, 1996.

TABLE 3

**INVASIVE EXOTICS OF PRIORITY CONCERN WITHIN THE FOREST OF
NISENE MARKS STATE PARK**

Species	Common name	Status
<i>Brassica nigra</i>	black mustard	List B
<i>Centaurea solstitialis</i>	yellow star-thistle	List A-1
<i>Cirsium vulgare</i>	bull thistle	List B
<i>Conium maculatum</i>	poison hemlock	List B
<i>Cordatella jubata</i>	pampas grass	List A-1
<i>Erechtites minima</i>	Australian fireweed	List B
<i>Eucalyptus globulus</i>	blue gum	List A-1
<i>Foeniculum vulgare</i>	fennel	List A-1
<i>Genista monspessulana</i>	French broom	List A-1
<i>Hedera helix</i> ssp. <i>helix</i>	english ivy	List B
<i>Holcus lanatus</i>	velvet grass	List B
<i>Rubus discolor</i>	Himalayan blackberry	List A-1
<i>Vinca major</i>	greater periwinkle	List B

Status Codes:

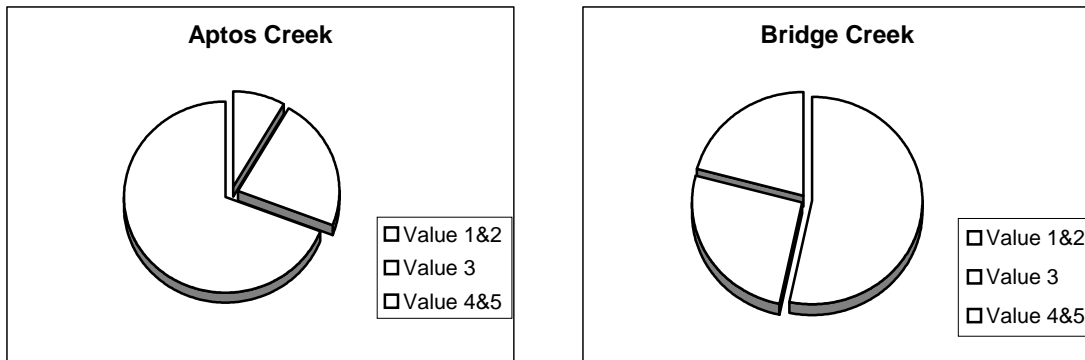
List A-1: Most invasive wildland pest plants; widespread, documented as aggressive invaders that displace natives and disrupt natural habitats

List B: Wildland pest plants of lesser invasiveness; species that spread less rapidly and cause a lesser degree of habitat disruption

TABLE 4
SITE VALUE PERCENTAGES

	<u>Value 1</u>	<u>Value 2</u>	<u>Value 3</u>	<u>Value 4</u>	<u>Value 5</u>
Aptos Creek	0	8.4	22.3	12.3	57
Bridge Creek	13.9	39.5	25.7	0	20.9

Proportion of sampling locations with high and low spawning-site values in Aptos and Bridge Creeks. Spawning-site value is based on embeddedness; a value of 1 is the highest quality for spawning (see text).



Since Aptos Creek had no sites with a value of 1 and Bridge Creek no sites with a value of 4, values 1 and 2, along with values 4 and 5, are combined).

TABLE 5

**SPECIAL-STATUS SPECIES PRESENT OR POTENTIALLY OCCURRING
WITHIN THE FOREST OF NISENE MARKS STATE PARK**

Common name <i>Scientific name</i>	Listing Status USFWS/CDFG/CNPS	Habitat Type	Potential to Occur
FEDERALLY OR STATE LISTED RARE, THREATENED, OR ENDANGERED SPECIES			
<i>INVERTEBRATES</i>			
Smith's blue butterfly <i>Euphilotes enoptes smithi</i>	FE/ -	Monterey Bay south through Big Sur to near Point Gorda, occurring in scattered populations in association with coastal dune, coastal scrub, chaparral, and grassland habitats	Moderate Scrub, chaparral, and grassland habitats provide suitable habitat
<i>FISH</i>			
Coho salmon – central California coast ESU <i>Oncorhynchus kisutch</i>	FT/CE	Spawn in streams at riffles with small to medium gravel substrates	Present Known from stream surveys in Aptos Creek
Steelhead – central coast ESU <i>Oncorhynchus mykiss irideus</i>	FT/CSC	Spawn in streams over gravel/cobble substrates	Present Known from stream surveys in Aptos and Bridge creeks
<i>AMPHIBIANS</i>			
Santa Cruz long-toed salamander <i>Ambystoma macrodactylum croceum</i>	FE/CE	Temporary ponds and vegetated drainages	Moderate The Park provides suitable habitat and is in close proximity to the northern Santa Cruz metapopulation for this species
California red-legged frog <i>Rana aurora draytonii</i>	FT/CSC	Freshwater ponds and slow streams but can use virtually any freshwater system; requires surface water of 20 inches minimum depth from March – July; associated uplands, dispersal, and estivation habitat also critical	Present Found in streams, marshy areas, and ponds within the Park
<i>BIRDS</i>			
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT/CE	Breeds in coastal forests; tree nests require large-diameter limbs or other suitable platform in large conifers	Low to Moderate Suitable niche habitat (e.g., large-diameter limbs generally associated with old growth forests) is absent from the Park.
<i>PLANTS</i>			
Coyote ceanothus <i>Ceanothus ferrisiae</i>	FE / -- / List 1B	Grassland, coastal scrub, chaparral, usually on serpentine soils	Present Reported from Santa Rosalia ridge

Monterey spineflower <i>Chorizanthe pungens</i> var. <i>pungens</i>	FT /--/ List 1B	Coastal dunes and scrub, maritime chaparral, cismontane woodland, grassland, sandy soils	Moderate Most suitable habitat exists above elevational limits for this species. Designated Critical Habitat as proposed by USFWS is located more than 4 miles southeast of the Park.
Santa Cruz tarplant <i>Holocarpha macradenia</i>	FT/ CE / List 1B	Coastal prairie or grasslands (often associated with clays)	Low to Moderate Suitable habitat on-site limited.
San Francisco popcorn-flower <i>Plagiobothrys diffusus</i>	FS / CE /List 1B	Coastal prairie and grasslands	Low to Moderate Habitat limited on-site.
FEDERAL OR STATE SPECIES OF CONCERN			
<i>AMPHIBIANS</i>			
California tiger salamander <i>Ambystoma californiense</i>	--/CSC	Grasslands; requires vernal pools or other seasonal water sources for breeding; also requires underground refuges, especially ground squirrel holes	Moderate Suitable habitat may be present at Buzzard's Lagoon , White's Lagoon, Hinckley Basin, and other temporary wetland areas
Foothill yellow-legged frog <i>Rana boylei</i>	--/CSC	In or near rocky streams, especially shallow portions of streams with rocky substrate; cobble-sized substrate is suitable for egg-laying	Present Reported from stream surveys in Aptos and Bridge creeks
<i>REPTILES</i>			
Western pond turtle <i>Clemmys marmorata</i>	--/CSC	Permanent or nearly permanent water in ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites (open mud banks, partly submerged logs, etc)	Present Reported from the Park
California horned lizard <i>Phrynosoma coronatum frontale</i>	FSC / CSC	Friable soils in shrub habitat	Low to Moderate Habitat limited on-site.
<i>BIRDS</i>			
Cooper's hawk (nesting) <i>Accipiter cooperii</i>	--/CSC; 3503.5	Nests in extensive forests, woodlots, occ. single trees. General habitat is deciduous, mixed and evergreen forest; deciduous stands of riparian habitat	Present Nesting is reported in the Park
Sharp-shinned hawk (nesting) <i>Accipiter striatus</i>	--/CSC	Nests in most forest types in range, esp. relatively dense stands of conifers or deciduous trees	Moderate Known from Park, but nesting not confirmed and Park is to south of general nesting range
Bell's sage sparrow <i>Amphispiza belii belii</i>	FSC / -	Scrub and chaparral	Moderate Suitable habitat is available in the Park
Long-eared owl <i>Asio otus</i>	--/CSC	Breeds in coniferous and mixed coniferous-deciduous forest, esp. near water	Moderate to High A large amount of suitable habitat is available in the Park
Ferruginous hawk <i>Buteo regalis</i>	FSC / -	Woodlands	High A large amount of suitable habitat is available in the Park

Golden eagle <i>Aquila chrysaetos</i>	CSC, CFP, 3503.5/-	Open areas with associated cliffs or trees for nesting	High A large amount of suitable habitat is available in the Park
Costa's hummingbird <i>Calypte costae</i>	FSC / -	Scrub	Moderate Suitable habitat is available in the Park
Lawrence's goldfinch <i>Carduelis lawtencei</i>	FSC / -	Forests, woodlands or scrub	High A large amount of suitable habitat is available in the Park
Vaux's swift <i>Chaetura vauxi</i>	--/CSC	Nests in redwood and Douglas fir forests, in hollow trees or snags	High Reported as nesting in Santa Cruz County (Santa Cruz County Bird Club checklist)
Lark sparrow <i>Chondestes grammacus</i>	FSC / -	Brush and trees	Moderate Suitable habitat is available in the Park
Olive sided flycatcher <i>Contopus cooperi</i>	FSC / -	Forests and woodlands	High A large amount of suitable habitat is available in the Park
Black swift <i>Cypseloides niger</i>	- / CSC (nesting)	Breeds on cliffs behind or adjacent to waterfalls in deep canyons and bluffs	High A large amount of suitable habitat is available in the Park
Hermit warbler <i>Dendroica occidentalis</i>	FSC / -	Conifer forests	High A large amount of suitable habitat is available in the Park
California warbler <i>Dendroica petechia brewsteri</i>	- / CSC	Nests in riparian woodlands	Moderate Suitable habitat is available in the Park
White-tailed kite <i>Elanus leucurus</i>	FSC / CFP, 3503.5	Nests in dense topped trees in vicinity of marshes and grasslands	High A large amount of suitable habitat is available in the Park
Pacific slope flycatcher <i>Epidonax difficilis</i>	FSC / -	Moist woods and forests	High A large amount of suitable habitat is available in the Park
Loggerhead shrike <i>Lanius ludovicianus</i>	FSC / CSC	Nests in open fields and woodlands	High A large amount of suitable habitat is available in the Park
Lewis' woodpecker <i>Melanerpes lewis</i>	FSC / -	Woodlands	High A large amount of suitable habitat is available in the Park
Long-billed curlew <i>Numenius americanus</i>	FSC / CSC	Nests near water in prairies and grassy meadows	High A large amount of suitable habitat is available in the Park
Osprey <i>Pandion haliaetus</i>	- / CSC, 3503.5	Nests on tall snags and hunts over open water	High A large amount of suitable habitat is available in the Park
Rufous hummingbird <i>Selasphorus rufus</i>	FSC / -	Forest edges and meadows	Moderate Suitable habitat is available in the Park
Allen's hummingbird <i>Selasphorus sasin</i>	FSC / -	Wooded or brushy areas	High A large amount of suitable habitat is available in the Park
Red-breasted sapsucker <i>Sphyrapicus ruber</i>	FSC / -	Woodlands	High A large amount of suitable habitat is available in the Park
California thrasher <i>Toxostoma redivivum</i>	FSC / -	Chaparral	Moderate Suitable habitat is available in the Park
MAMMALS			

Pallid bat <i>Antrozous pallidus</i>	- / CSC	Caves, crevices, mines, open buildings	Moderate to High Various species of bat are presumed present within the Park.
Pacific western (Townsend's) big-eared bat <i>Corynothinus townsendii townsendii</i>	FSC / -	Buildings, caves, and cliffs	Moderate to High Various species of bat are presumed present within the Park.
Western mastiff bat <i>Eumops perotis californicus</i>	FSC / -	Crevices on cliff faces, high buildings, trees, and tunnels	Moderate to High Various species of bat are presumed present within the Park.
Long-eared myotis <i>Myotis evotis</i>	FSC / -	Crevices, under bark, snags, forests	Moderate to High Various species of bat are presumed present within the Park.
Small-footed myotis <i>Myotis leibii</i>	FSC / -	Caves, and crevices, sometimes bridges and bark	Moderate to High Various species of bat are presumed present within the Park.
Fringed myotis <i>Myotis thysanodes</i>	FSC / -	Caves, crevices, montane forest	Moderate to High Various species of bat are presumed present within the Park.
Long-legged myotis bat <i>Myotis volans</i>	FSC / -	Buildings, caves, and cliffs	Moderate to High Various species of bat are presumed present within the Park.
Yuma myotis bat <i>Myotis yumanensis</i>	FSC / -	Buildings, caves, and cliffs	Moderate to High Various species of bat are presumed present within the Park.
PLANTS			
Santa Cruz manzanita <i>Arctostaphylos andersonii</i>	FSC / -- / List 1B	Chaparral and coniferous forests – often associated with redwoods	Present Reported observed, location unknown.
SPECIES OF OTHER CONCERN			
BIRDS			
Red-tailed hawk <i>Buteo jamaicensis</i>	- / 3503.5	Nests in large trees.	High A large amount of suitable habitat is available in the Park
American kestrel <i>Falco sparverius</i>	- / 3503.5	Nests in cavities of snags.	High A large amount of suitable habitat is available in the Park
MAMMALS			
Cougar <i>Felis concolor</i>	--/4800	Variety of habitats where sufficient prey (primarily deer) is found	High Reported from the Park; range is expanding and the Park holds prey
PLANTS			
Hooker's manzanita <i>Arctostaphylos hookeri</i> ssp. <i>hookeri</i>	-- / -- / List 1B	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub in sandy soils	Moderate Suitable habitat of limited extent exists.
Bristly sedge <i>Carex comosa</i>	-- / -- /List 2	Coastal prairie, freshwater marshes, valley and foothill grassland	Present Reported observed, White's Lagoon.
Santa Cruz Mountains beardtongue <i>Penstemon rattanii</i> var. <i>kleei</i>	-- / -- / List 1B	Sandy shale slopes often in the transition from forest to chaparral	Present Observed at Santa Rosalia ridge. Reported on the road leading to Cusack Meadow.

Santa Cruz clover <i>Trifolium buckwestiorum</i>	-- / -- / List 1B	Margins of broadleaved upland forests and coastal prairie	Present Observed at Cusack's meadow.
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Federal Categories (USFWS)

FE = Listed as Endangered by the Federal Government
 FT = Listed as Threatened by the Federal Government
 FSC = Federal Species of Concern (former Category 2 Candidate)

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California
 List 1B = Plants rare, threatened, or endangered in California and elsewhere
 List 2 = Plants rare, threatened, or endangered in California but more common
 List 3 = Plants about which more information is needed
 List 4 = Plants of limited distribution

State Categories (CDFG)

CE = Listed as Endangered by the State of California
 CT = Listed as Threatened by the State of California

Present = Species observed within the Park

High Potential = Species expected to occur and meets all habitats as defined in list

Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range

Low Potential = Habitat absent or only marginally suitable habitat is present

TABLE 6**RECORD SEARCH RESULTS FOR THE FOREST OF NISENE MARKS STATE PARK**

Site	Site Type	Site Record/Report	Constituents
SCr-1	Midden with shell	Riddell 1949	1 mortar, 2 pestles, 1 antler tool, steatite and abalone ornaments, charred nut hulls; items associated with single human burial
SCr-2	Burial mound	Riddell and Pilling 1949; Tamez and Gordin 1977; Cartier 1979	Cemetery for village site at SCr-1
SCr-52	Isolate burial	Baumhoff 1954	2 mortars, 2 pestles, 1 core tool, 1 flake tool, 1 chertstone; mortars and pestles associated with human burial
SCr-90	Lithic scatter	Lonnberg and Morris 1973	1 hopper mortar, 1 metate, chert debitage
SCr-135	Midden with shell	Wardell 1975	1 flake tool, chert debitage, marine shell
SCr-196	Lithic scatter	Kerr 1978	1 flake tool, chert and other debitage
SCr-201	Midden with shell	Furnis and Gilbert 1984; Olsen 1973	Marine shell
SCr-206	Lithic scatter	Cabrillo College 1979	1 hammerstone, fire-cracked rock
SCr-221	Midden with shell	Morris 1979	1 hammerstone, fire-cracked rock, faunal remains, marine shell
SCr-222	Midden with shell	Morris 1979	Fire-cracked rock, faunal remains, marine shell
SCr-226	Lithic scatter	Johnson 1979; Basin Research 1984	1 core, chert debitage
SCr-231	Lithic scatter	Roop 1980; Basin Research 1984	Chert debitage
SCr-233	Midden with shell	Cabrillo College 1980	1 pestle, 1 hammerstone, chert debitage, marine shell
SCr-264	Midden with shell	Woodward 1983	Cobbles, cobble fragments, marine shell
SCr-296	Milling station and lithic scatter	Dillon 1992	7 bedrock features with cupules and/or mortars, chert and obsidian debitage
SCr-297H	Milling station	Dillon 1992	Bedrock feature with 5 mortars
SCr-298	Milling station	Dillon 1992	Bedrock feature with 1 mortar

TABLE 7**EXISTING DAILY TRAFFIC VOLUMES ON ROADWAYS IN THE STUDYAREA**

Roadway	Location^a	Daily Traffic (Vehicles Per Day)
State Route 1	e/o Rio Del Mar Boulevard	73,000
	w/o State Park Drive	83,000
	e/o State Route 17	104,000
State Route 17	n/o Summit Road	62,000
	n/o State Route 1	66,000
State Route 35	w/o State Route 17	1,050
State Park Drive	s/o Soquel Drive	23,640
Soquel Drive	w/o Rio Del Mar Boulevard	9,378
	e/o State Park Drive	20,194
Rio Del Mar Boulevard	s/o Soquel Drive	16,469
Summit Road	e/o Old Santa Cruz Highway	5,424

^a n/o = north of; w/o = west of; e/o = east of; and s/o = south of

SOURCE: Caltrans, *2000 Traffic Volumes on California State Highways*, 2001; Santa Cruz County Regional Transportation Commission, 1985-2001 average daily traffic counts.

Figures

Slopes

The Forest of Nisene Marks State Park

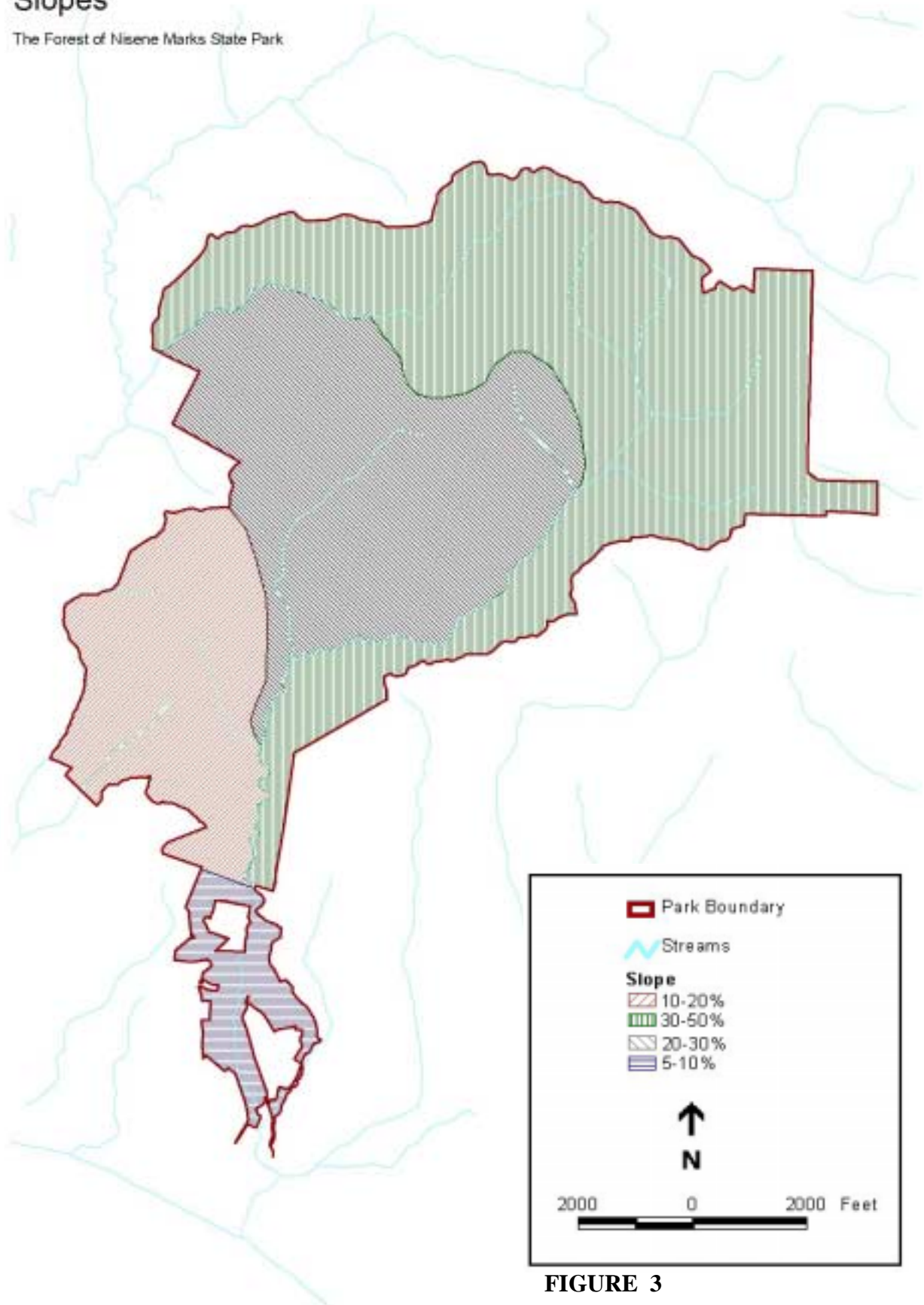


FIGURE 3

Soils

The Forest of Nisene Marks State Park

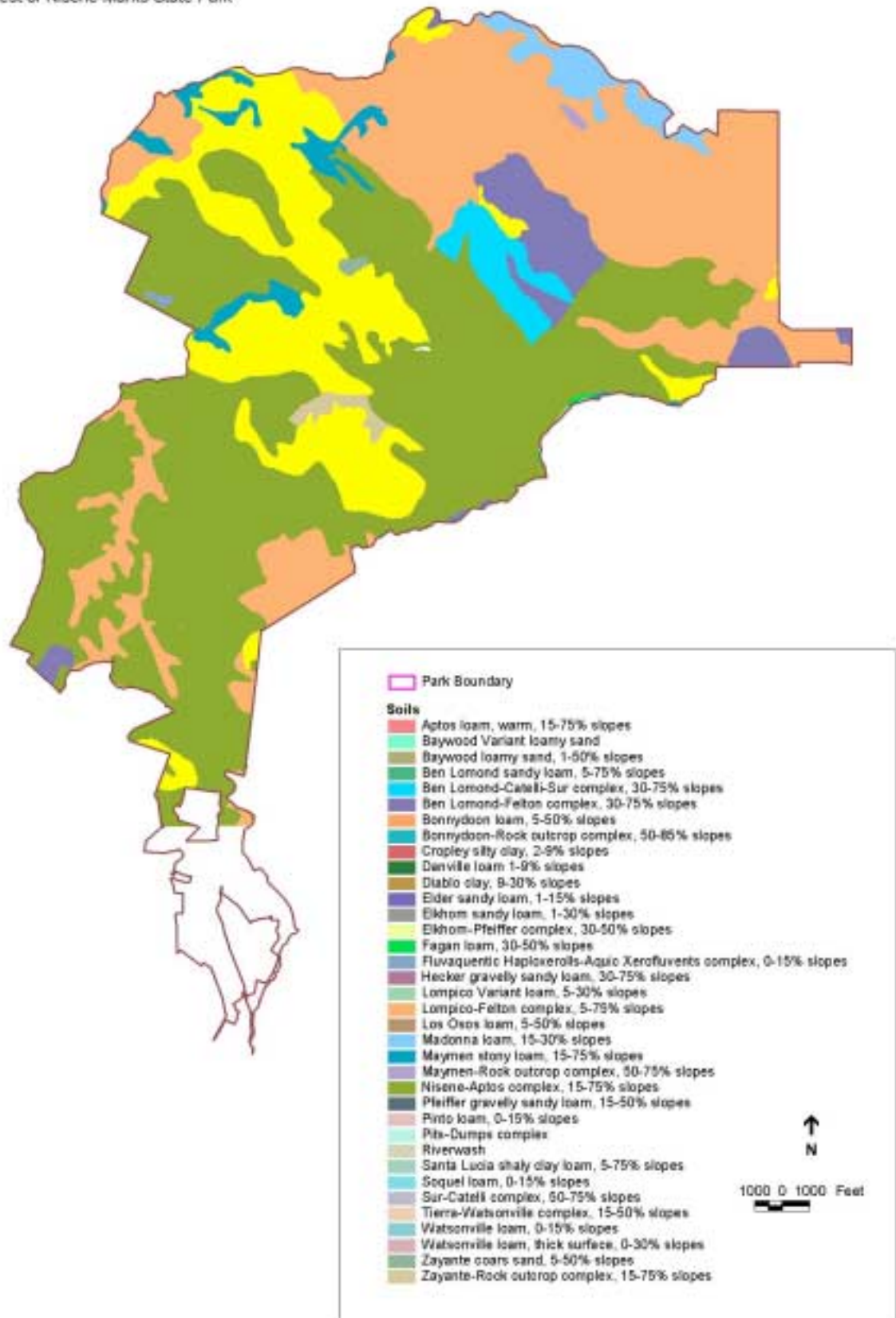


FIGURE 4

Geology

The Forest of Nisene Marks State Park

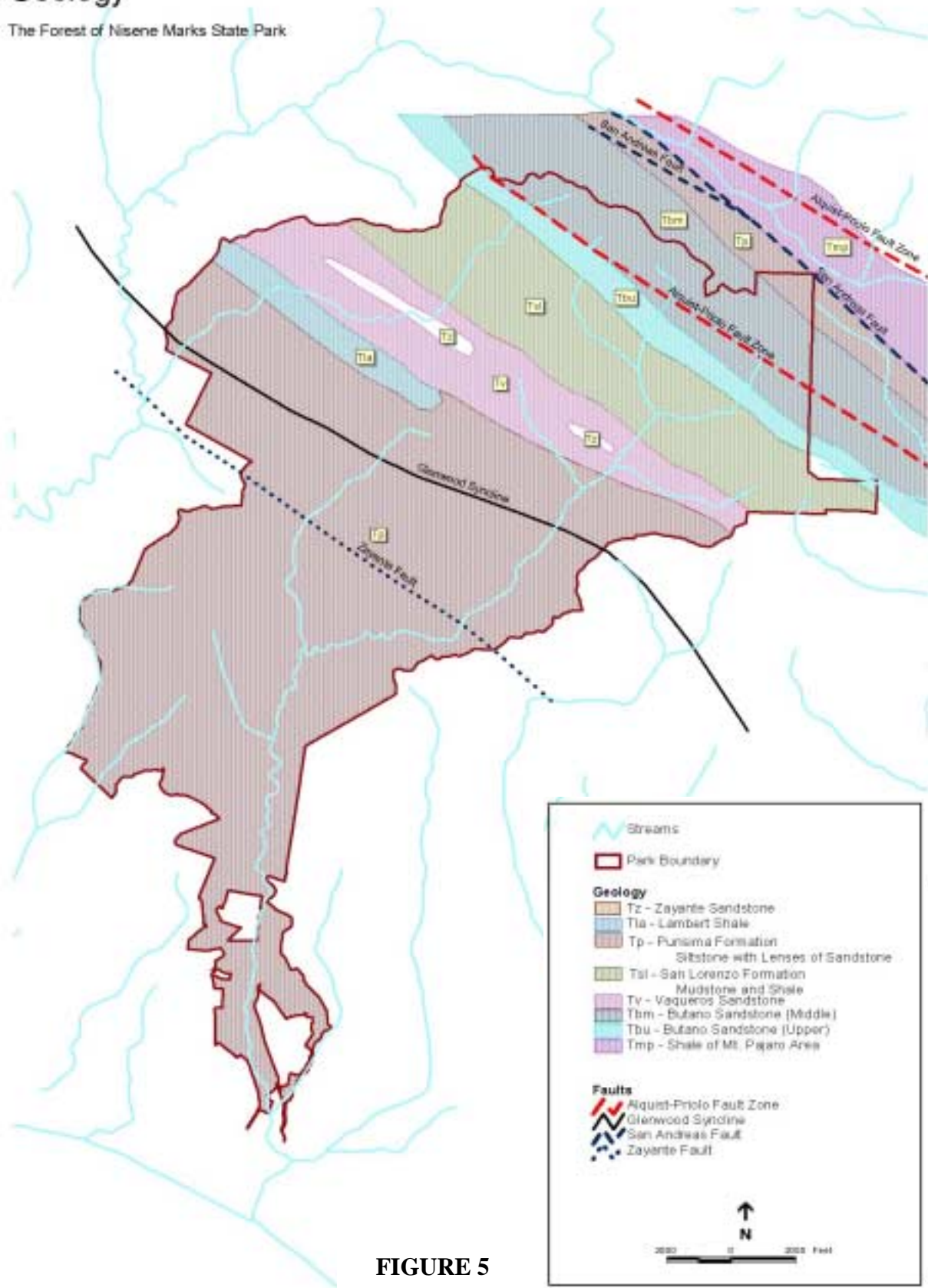


FIGURE 5

Vegetation Series

The Forest of Nisene Marks State Park

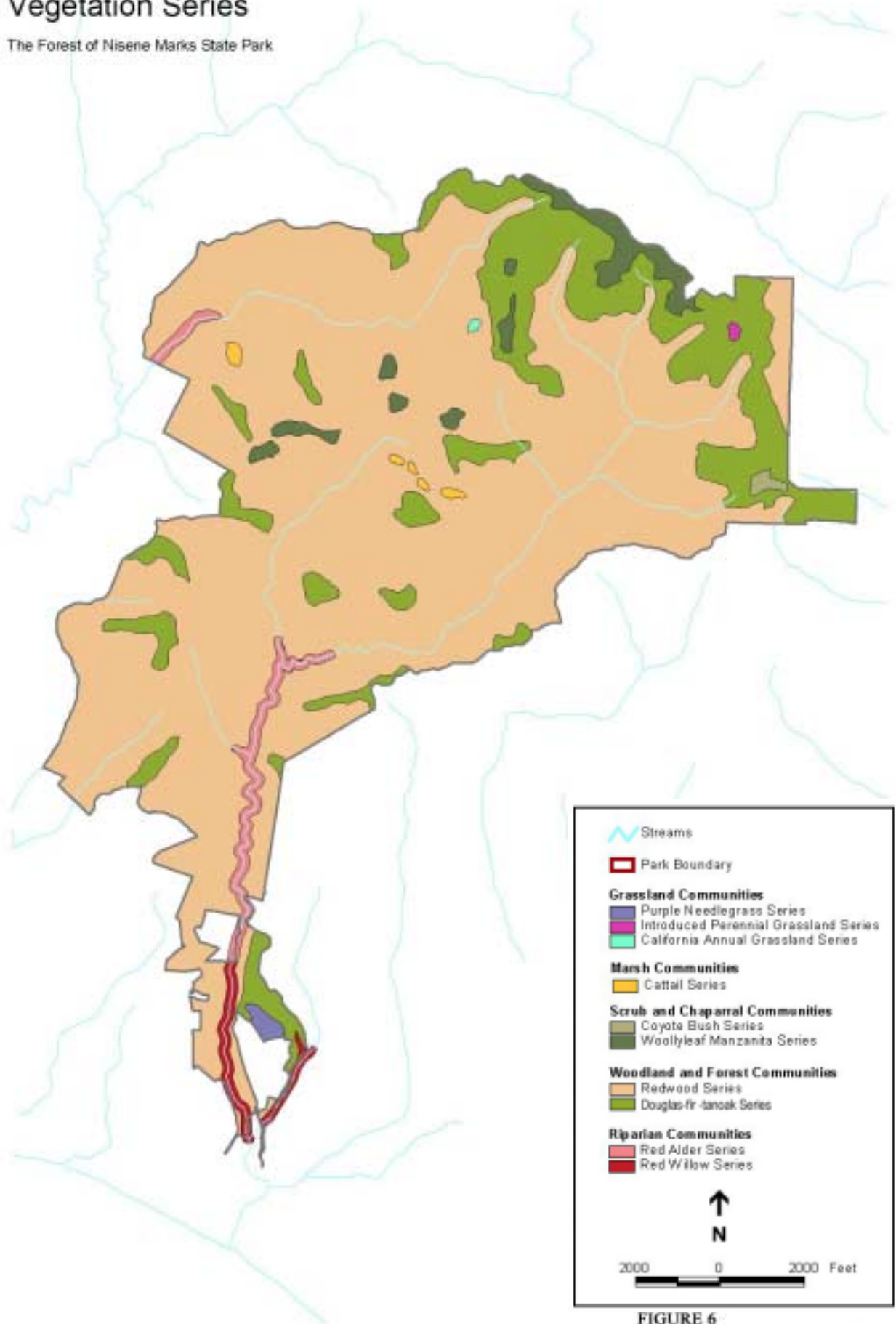
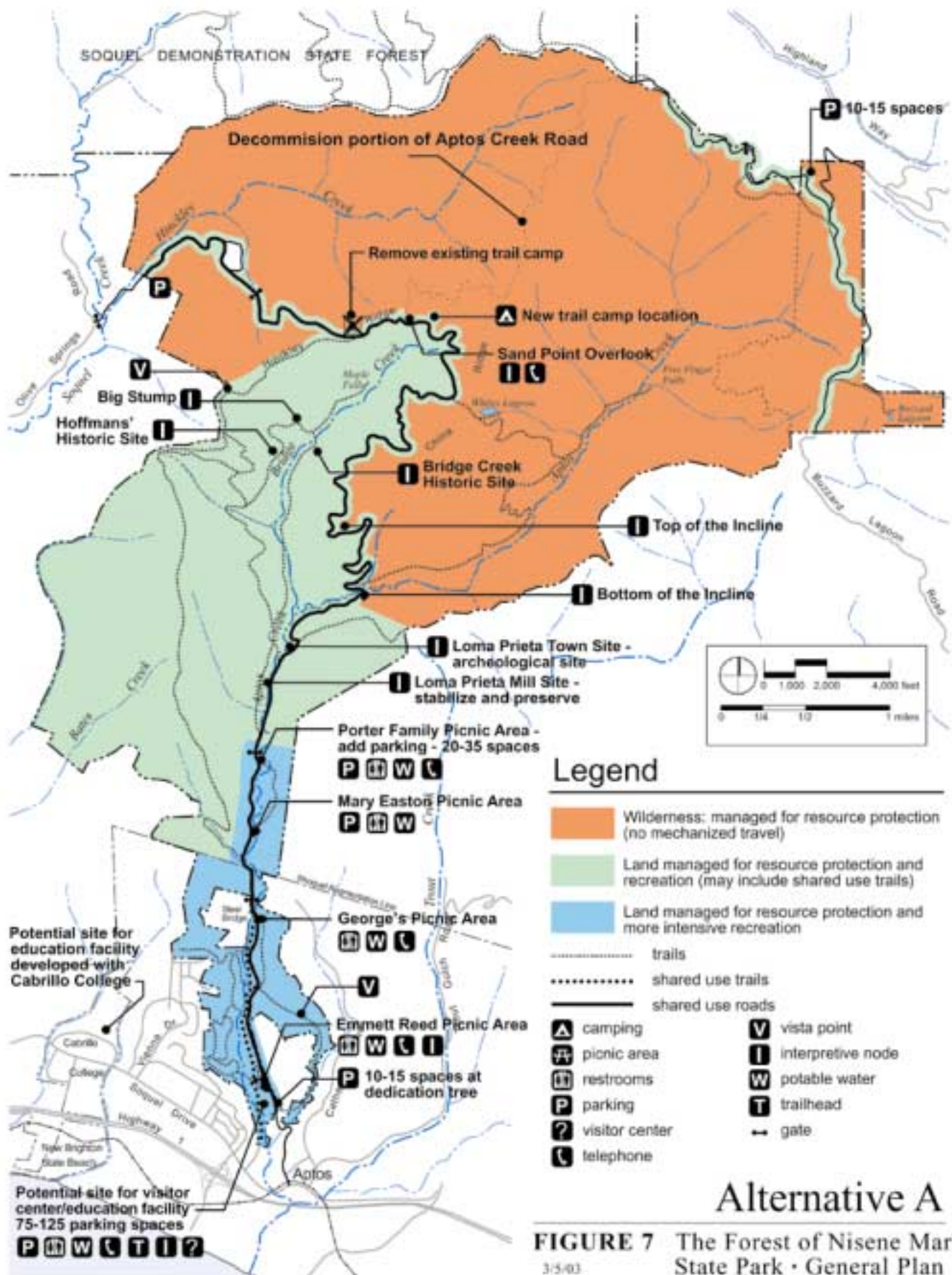
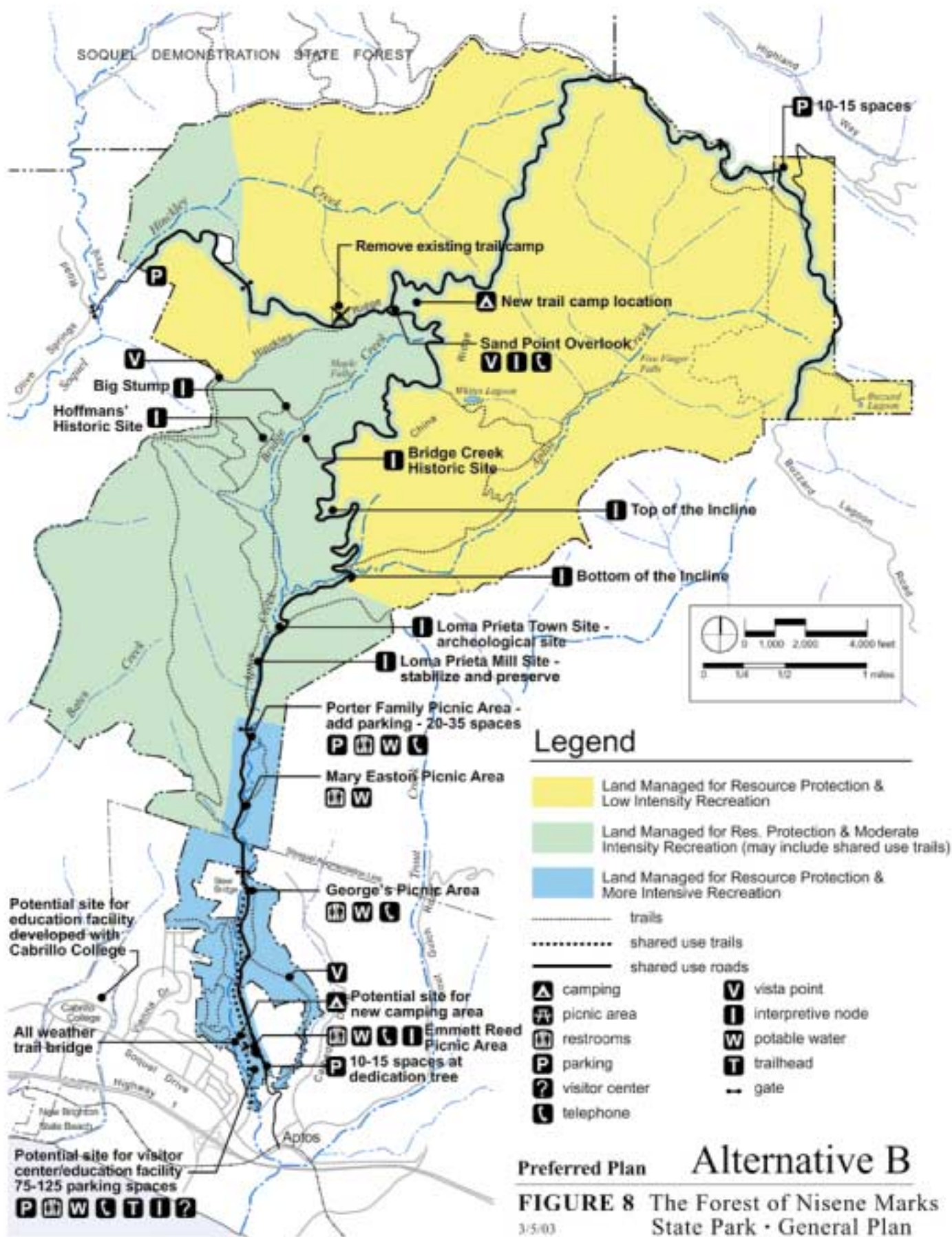


FIGURE 6





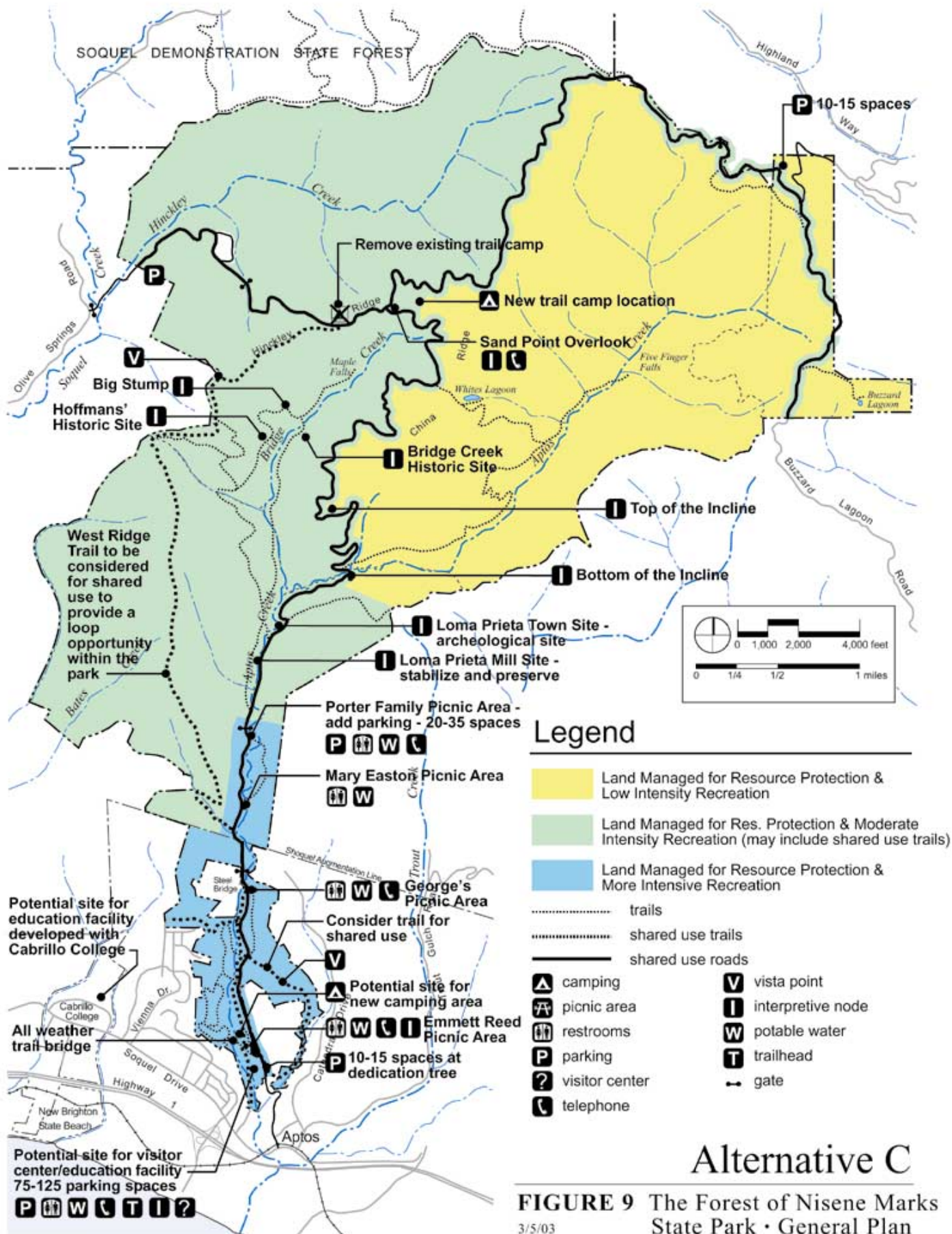


FIGURE 9 The Forest of Nisene Marks State Park • General Plan

3/5/03

Appendices

APPENDIX A

DEFINITIONS OF BENEFICIAL USES OF SURFACE WATERS WITHIN THE FOREST OF NISENE MARKS STATE PARK

Waterbody	Beneficial Use	Description
Hinckley Creek Aptos Creek Bridge Creek	Municipal and Domestic Supply	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
Hinckley Creek Aptos Creek Bridge Creek	Agricultural Supply	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
Hinckley Creek Aptos Creek	Industrial Service Supply	Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.
Hinckley Creek Aptos Creek	Groundwater Recharge	Uses of water for natural or artificial maintenance of groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers. Groundwater recharge includes recharge of surface water underflow.
Aptos Creek	Freshwater Replenishment	Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity) which includes a water body that supplies water to a different type of water body, such as, streams that supply reservoirs and lakes, or estuaries; or reservoirs and lakes that supply streams. This includes only immediate upstream water bodies and not their tributaries.
Aptos Creek	Estuarine Habitat	Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
Hinckley Creek Aptos Creek Bridge Creek	Wildlife Habitat	Uses of water that support wildlife habitats involving preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.
Hinckley Creek Aptos Creek Bridge Creek	Cold freshwater habitat	Uses of water that support cold water ecosystems involving preservation or enhancement of aquatic habitats, vegetation, fish or wildlife.

Hinckley Creek Aptos Creek Bridge Creek	Migration of Aquatic Organisms	Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.
Hinckley Creek Aptos Creek Bridge Creek	Spawning, Reproduction, and/or Early Development	Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
Hinckley Creek Aptos Creek Bridge Creek	Preservation of Biological Habitats of Special Significance	Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reservoirs, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
Hinckley Creek Aptos Creek Bridge Creek	Commercial and Sport Fishing	Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
Hinckley Creek Aptos Creek Bridge Creek	Contact Recreation	Uses of water for recreational activities involving bodily contact with water, where ingestion of water is possible.
Hinckley Creek Aptos Creek Bridge Creek	Non-Contact Recreation	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion is reasonably possible.

SOURCE: Regional Water Quality Control Board, Region 3, 1994 *Water Quality Control Plan*.

APPENDIX B

SPECIAL-STATUS SPECIES PRESENT OR POTENTIALLY OCCURRING WITHIN THE FOREST OF NISENE MARKS STATE PARK

Common name <i>Scientific name</i>	Listing Status USFWS/CDFG/CNPS	Habitat Type	Potential to Occur
FEDERALLY OR STATE LISTED RARE, THREATENED, OR ENDANGERED SPECIES			
<i>INVERTEBRATES</i>			
Ohlone tiger beetle <i>Cicindela ohlone</i>	FE/ -	Open areas within native grasslands along the central California coast	Low Ohlone tiger beetles have not been located within the Park
Mt. Herman June beetle <i>Polyphylla barbata</i>	FE/ -	Restricted to the Zayante sand hills habitat of the Ben Lomond-Mount Hermon-Scotts Valley area.	Absent The Park is outside this species range
Zayante band-winged grasshopper <i>Trimerotropis infantilis</i>	FE/ -	Restricted to the Zayante sand hills habitat of the Ben Lomond-Mount Hermon-Scotts Valley area.	Absent The Park is outside this species range
Smith's blue butterfly <i>Euphilotes enoptes smithi</i>	FE/ -	Monterey Bay south through Big Sur to near Point Gorda, occurring in scattered populations in association with coastal dune, coastal scrub, chaparral, and grassland habitats	Moderate Scrub, chaparral, and grassland habitats provide suitable habitat
<i>FISH</i>			
Coho salmon – central California coast ESU <i>Oncorhynchus kisutch</i>	FT/CE	Spawn in streams at riffles with small to medium gravel substrates	Present Known from stream surveys in Aptos Creek
Steelhead – central coast ESU <i>Oncorhynchus mykiss irideus</i>	FT/CSC	Spawn in streams over gravel/cobble substrates	Present Known from stream surveys in Aptos and Bridge creeks
<i>AMPHIBIANS</i>			
Santa Cruz long-toed salamander <i>Ambystoma macrodactylum croceum</i>	FE/CE	Temporary ponds and vegetated drainages	Moderate The Park provides suitable habitat and is in close proximity to the northern Santa Cruz metapopulation for this species
California red-legged frog <i>Rana aurora draytonii</i>	FT/CSC	Freshwater ponds and slow streams but can use virtually any freshwater system; requires surface water of 20 inches minimum depth from March – July; associated uplands, dispersal, and estivation habitat also critical	Present Found in streams, marshy areas, and ponds within the Park
<i>BIRDS</i>			
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT/CE	Breeds in coastal forests; tree nests require large-diameter limbs or other suitable platform in large conifers	Low to Moderate Suitable niche habitat (e.g., large-diameter limbs generally associated with old growth forests) is absent from the Park.
<i>PLANTS</i>			

Coyote ceanothus <i>Ceanothus ferrisiae</i>	FE / -- / List 1B	Grassland, coastal scrub, chaparral, usually on serpentine soils	Present Reported from Santa Rosalia ridge
Ben Lomond spineflower <i>Chorizanthe pungens</i> var. <i>hartwegiana</i>	FE / -- / List 1B	Zayante coarse sands in maritime ponderosa pine sandhills	Low Restricted distribution, habitat not present on-site.
Monterey spineflower <i>Chorizanthe pungens</i> var. <i>pungens</i>	FT / -- / List 1B	Coastal dunes and scrub, maritime chaparral, cismontane woodland, grassland, sandy soils	Moderate Most suitable habitat exists above elevational limits for this species. Designated Critical Habitat as proposed by USFWS is located more than 4 miles southeast of the Park.
Scott's Valley spineflower <i>Chorizanthe robusta</i> var. <i>hartwegii</i>	FE / -- / List 1B	Xeric or sandy meadows or grasslands on mudstone or Purisima outcrops	Low Known from only three occurrences in Scott's Valley. Designated Critical Habitat as proposed by USFWS is located approx. 5 miles west of the Park.
Robust spineflower <i>Chorizanthe robusta</i> var. <i>robusta</i>	FE / -- / List 1B	Sandy terraces and bluffs within cismontane woodlands, dunes or scrub	Low Rarely found inland from coastal dunes. Designated Critical Habitat as proposed by USFWS is located approx. ½ mile east of the Park.
Santa Cruz wallflower <i>Erysimum teretifolium</i>	FE / CE / List 1B	Chaparral or coniferous forests on inland marine sands	Low Suitable habitat does not exist on-site.
Sand gilia <i>Gilia tenuiflora</i> ssp. <i>arenaria</i>	FE / CT / List 1B	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, in sandy soils, openings.	Low Limited distribution, known from fewer than twenty occurrences.
Santa Cruz tarplant <i>Holocarpha macradenia</i>	FT / CE / List 1B	Coastal prairie or grasslands (often associated with clays)	Low to Moderate Suitable habitat on-site limited.
White-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE / CE / List 1B	Open dry rocky slopes and grassy areas – often on soils derived from serpentine	Low Suitable habitat limited in extent, no serpentine soils.
San Francisco popcorn-flower <i>Plagiobothrys diffusus</i>	FS / CE / List 1B	Coastal prairie and grasslands	Low to Moderate Habitat limited on-site.
FEDERAL OR STATE SPECIES OF CONCERN			
AMPHIBIANS			
California tiger salamander <i>Ambystoma californiense</i>	--/CSC	Grasslands; requires vernal pools or other seasonal water sources for breeding; also requires underground refuges, especially ground squirrel holes	Moderate Suitable habitat may be present at Buzzard's Lagoon, White's Lagoon, Hinckley Basin, and other temporary wetland areas
Foothill yellow-legged frog <i>Rana boylei</i>	--/CSC	In or near rocky streams, especially shallow portions of streams with rocky substrate;	Present Reported from stream surveys in Aptos and Bridge creeks

		cobble-sized substrate is suitable for egg-laying	
REPTILES			
Western pond turtle <i>Clemmys marmorata</i>	--/CSC	Permanent or nearly permanent water in ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites (open mud banks, partly submerged logs, etc)	Present Reported from the Park
California horned lizard <i>Phrynosoma coronatum frontale</i>	FSC / CSC	Friable soils in shrub habitat	Low to Moderate Habitat limited on-site.
BIRDS			
Cooper's hawk (nesting) <i>Accipiter cooperii</i>	--/CSC; 3503.5	Nests in extensive forests, woodlots, occ. single trees. General habitat is deciduous, mixed and evergreen forest; deciduous stands of riparian habitat	Present Nesting is reported in the Park
Northern goshawk (nesting) <i>Accipiter gentilis</i>	--/CSC	Open woodland and mixed, often mostly coniferous, forest	Low Suitable breeding habitat present in the Park, but breeding range is largely to north
Sharp-shinned hawk (nesting) <i>Accipiter striatus</i>	--/CSC	Nests in most forest types in range, esp. relatively dense stands of conifers or deciduous trees	Moderate Known from Park, but nesting not confirmed and Park is to south of general nesting range
Tricolor blackbird <i>Agelaius tricolor</i>	FSC / CSC	Nests in cattails and dense vegetation near water	Low Suitable wetland areas are limited and the Park is not in area where this species is numerous
Grasshopper sparrow <i>Ammodramus savannarum</i>	FSC / -	Grasslands	Low Suitable habitat is restricted in the Park
Bell's sage sparrow <i>Amphispiza belli belli</i>	FSC / -	Scrub and chaparral	Moderate Suitable habitat is available in the Park
Great blue heron <i>Ardea herodias</i>	- / CSC (nesting)	Colonial nesting in large trees.	Low Suitable habitat is restricted in the Park
Western burrowing owl <i>Athene cunicularia</i>	FSC / CSC, 3503.5	Nests in burrows of small mammals in grasslands	Low Suitable habitat is restricted in the Park
Long-eared owl <i>Asio otus</i>	--/CSC	Breeds in coniferous and mixed coniferous-deciduous forest, esp. near water	Moderate to High A large amount of suitable habitat is available in the Park
Ferruginous hawk <i>Buteo regalis</i>	FSC / -	Woodlands	High A large amount of suitable habitat is available in the Park
Golden eagle <i>Aquila chrysaetos</i>	CSC, CFP, 3503.5/-	Open areas with associated cliffs or trees for nesting	High A large amount of suitable habitat is available in the Park
Costa's hummingbird <i>Calypte costae</i>	FSC / -	Scrub	Moderate Suitable habitat is available in the Park
Lawrence's goldfinch <i>Carduelis lawtencei</i>	FSC / -	Forests, woodlands or scrub	High A large amount of suitable habitat is available in the Park
Vaux's swift	--/CSC	Nests in redwood and Douglas	High

<i>Chaetura vauxi</i>		fir forests, in hollow trees or snags	Reported as nesting in Santa Cruz County (Santa Cruz County Bird Club checklist)
Lark sparrow <i>Chondestes grammacus</i>	FSC / -	Brush and trees	Moderate Suitable habitat is available in the Park
Northern harrier <i>Circus cyaneus</i>	- / CSC (nesting), 3503.5	Nests in scrubby vegetation on edges of marshes	Low Suitable habitat is restricted in the Park
Olive sided flycatcher <i>Contopus cooperi</i>	FSC / -	Forests and woodlands	High A large amount of suitable habitat is available in the Park
Black swift <i>Cypseloides niger</i>	- / CSC (nesting)	Breeds on cliffs behind or adjacent to waterfalls in deep canyons and bluffs	High A large amount of suitable habitat is available in the Park
Hermit warbler <i>Dendroica occidentalis</i>	FSC / -	Conifer forests	High A large amount of suitable habitat is available in the Park
California warbler <i>Dendroica petechia brewsteri</i>	- / CSC	Nests in riparian woodlands	Moderate Suitable habitat is available in the Park
White-tailed kite <i>Elanus leucurus</i>	FSC / CFP, 3503.5	Nests in dense topped trees in vicinity of marshes and grasslands	High A large amount of suitable habitat is available in the Park
Pacific slope flycatcher <i>Epidonax difficilis</i>	FSC / -	Moist woods and forests	High A large amount of suitable habitat is available in the Park
California horned lark <i>Eremophila alpestris actia</i>	FSC / CSC	Breeds and winters in open grasslands and pastures	Low Suitable habitat is restricted in the Park
Merlin <i>Falco columbarius</i>	- / CSC	Nests in oak savannah	Low Suitable habitat is restricted in the Park
Loggerhead shrike <i>Lanius ludovicianus</i>	FSC / CSC	Nests in open fields and woodlands	High A large amount of suitable habitat is available in the Park
Lewis' woodpecker <i>Melanerpes lewis</i>	FSC / -	Woodlands	High A large amount of suitable habitat is available in the Park
Long-billed curlew <i>Numenius americanus</i>	FSC / CSC	Nests near water in prairies and grassy meadows	High A large amount of suitable habitat is available in the Park
Osprey <i>Pandion haliaetus</i>	- / CSC, 3503.5	Nests on tall snags and hunts over open water	High A large amount of suitable habitat is available in the Park
Rufous hummingbird <i>Selasphorus rufus</i>	FSC / -	Forest edges and meadows	Moderate Suitable habitat is available in the Park
Allen's hummingbird <i>Selasphorus sasin</i>	FSC / -	Wooded or brushy areas	High A large amount of suitable habitat is available in the Park
Red-breasted sapsucker <i>Sphyrapicus ruber</i>	FSC / -	Woodlands	High A large amount of suitable habitat is available in the Park
Spotted owl <i>Strix occidentalis occidentalis</i>	--/CSC	Dense, multi-layered canopy cover, including old growth conifer, partly logged redwood forest, closed canopy oak forests	Low Santa Cruz County Bird Club checklist notes several "problematic" reports from the County

California thrasher <i>Toxostoma redivivum</i>	FSC / -	Chaparral	Moderate Suitable habitat is available in the Park
MAMMALS			
Pallid bat <i>Antrozous pallidus</i>	- / CSC	Caves, crevices, mines, open buildings	Moderate to High Various species of bat are presumed present within the Park.
Pacific western (Townsend's) big-eared bat <i>Corynothinus townsendii townsendii</i>	FSC / -	Buildings, caves, and cliffs	Moderate to High Various species of bat are presumed present within the Park.
Western mastiff bat <i>Eumops perotis californicus</i>	FSC / -	Crevices on cliff faces, high buildings, trees, and tunnels	Moderate to High Various species of bat are presumed present within the Park.
Long-eared myotis <i>Myotis evotis</i>	FSC / -	Crevices, under bark, snags, forests	Moderate to High Various species of bat are presumed present within the Park.
Small-footed myotis <i>Myotis leibii</i>	FSC / -	Caves, and crevices, sometimes bridges and bark	Moderate to High Various species of bat are presumed present within the Park.
Fringed myotis <i>Myotis thysanodes</i>	FSC / -	Caves, crevices, montane forest	Moderate to High Various species of bat are presumed present within the Park.
Long-legged myotis bat <i>Myotis volans</i>	FSC / -	Buildings, caves, and cliffs	Moderate to High Various species of bat are presumed present within the Park.
Yuma myotis bat <i>Myotis yumanensis</i>	FSC / -	Buildings, caves, and cliffs	Moderate to High Various species of bat are presumed present within the Park.
PLANTS			
Santa Cruz manzanita <i>Arctostaphylos andersonii</i>	FSC / -- / List 1B	Chaparral and coniferous forests – often associated with redwoods	Present Reported observed, location unknown.
Bonny Doon manzanita <i>Arctostaphylos silvicola</i>	FSC / -- / List 1B	Chaparral and coniferous forests underlain by inland marine sands	Low Limited distribution. Known from fewer than 20 occurrences.
Coast wallflower <i>Erysimum ammophilum</i>	FSC/ -- / List 1B	Maritime chaparral, coastal dunes, coastal scrub in sandy soils, openings	Low Suitable habitat does not exist on-site.
San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	FSC / -- / List 1B	Coastal bluff scrub and grasslands – often associated with serpentine or sandy soils or rock outcrops	Low Suitable habitat of extremely limited extent.
Smooth lessingia <i>Lessingia micradenia</i> var. <i>glabrata</i>	FSC / -- / List 1B	Chaparral and cismontane woodland – generally associated with serpentine soils or road cuts	Low No serpentine soils on-site, limited distribution—11 known occurrences.
Dudley's lousewort <i>Pedicularis dudleyi</i>	FSC/ -- / List 1B	Maritime chaparral, cismontane woodland, north coast coniferous forest, valley and foothill grassland. Known from fewer than ten occurrences.	Low. Limited distribution. CNPS reports species extirpated in Santa Cruz County.

Monterey pine (native stands) <i>Pinus radiata</i>	FSC / -- / List 4	Mesic places within broadleaved upland forests, chaparral, and grasslands	Low Only 3 native stands occur in California at Ano Nuevo, Cambria and the Monterey Peninsula.
Scott's Valley polygonum <i>Polygonum hickmanii</i>	FSC / -- / List 1B	Annual grassland and wildflower fields occurring on fine-textured, shallow, well drained soils over outcrops of Santa Cruz mudstone and Purisima sandstone	Low Thought to be restricted to two sites in Scott's Valley.
SPECIES OF OTHER CONCERN			
INVERTEBRATES			
Mimic tryonia <i>Tryonia imitator</i>	--/--*	Coastal lagoons, estuaries, lagoons, and salt marshes	Low No appropriate habitat in the Park
Monarch butterfly <i>Danaus plexippus</i>	--/--*	Monarch butterflies roost in eucalyptus groves where they are protected from the wind and where nectar sources and water are nearby (CNDDDB, California Department of Fish and Game, 2000).	Low Appropriate habitat is scarce to non-existent in the Park
BIRDS			
Red-tailed hawk <i>Buteo jamaicensis</i>	- / 3503.5	Nests in large trees.	High A large amount of suitable habitat is available in the Park
American kestrel <i>Falco sparverius</i>	- / 3503.5	Nests in cavities of snags.	High A large amount of suitable habitat is available in the Park
MAMMALS			
Cougar <i>Felis concolor</i>	--/4800	Variety of habitats where sufficient prey (primarily deer) is found	High Reported from the Park; range is expanding and the Park holds prey
PLANTS			
Hooker's manzanita <i>Arctostaphylos hookeri</i> ssp. <i>hookeri</i>	-- / -- / List 1B	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub in sandy soils	Moderate Suitable habitat of limited extent exists.
Pajaro manzanita <i>Arctostaphylos pajaroensis</i>	-- / -- / List 1B	Chaparral – restricted to Monterey and Santa Cruz Counties	Low CNPS reports extirpated in Santa Cruz County.
Santa Cruz Mountains pussypaws <i>Calyptidium parryi</i> var. <i>hesseae</i>	-- / -- / List 3	Chaparral, cismontane woodland	Low CNPS reports extirpated from Loma Prieta and Santa Cruz quadrangles.
Bristly sedge <i>Carex comosa</i>	-- / -- / List 2	Coastal prairie, freshwater marshes, valley and foothill grassland	Present Reported observed, White's Lagoon.
Deceiving sedge <i>Carex saliniformis</i>	-- / -- / List 1B	Coastal prairie, coastal scrub, meadows, salt marshes	Low CNPS reports extirpated from Santa Cruz County and Laurel quadrangles.

Loma Prieta hoita <i>Hoita strobilina</i>	-- / -- / List 1B	Chaparral, cismontane woodland and riparian woodlands – generally associated with mesic serpentine sites	Low Serpentine soils do not occur on-site.
Kellog's horkelia <i>Horkelia cuneata</i> ssp. <i>sericea</i>	-- / -- / List 1B	Coastal scrub and closed cone pine forests, inland sand deposits	Low Suitable on-site habitat does not exist.
Arcuate bush mallow <i>Malacothamnus arcuatus</i>	-- / -- / List 1B	Chaparral	Low Limited suitable habitat, threatened by alteration of fire regimes.
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	-- / -- / List 3	Bare, rocky areas in grassland, chaparral, cismontane woodland, broadleaved upland forest	Low Suitable habitat extremely limited.
Marsh microseris <i>Microseris paludosa</i>	-- / -- / List 1B	Moist areas in closed cone coniferous forests, cismontane woodland, coastal scrub, and grasslands	Low Suitable habitat exists but species relatively uncommon.
Santa Cruz Mountains beardtongue <i>Penstemon rattanii</i> var. <i>kleei</i>	-- / -- / List 1B	Sandy shale slopes often in the transition from forest to chaparral	Present Observed at Santa Rosalia ridge. Reported on the road leading to Cusack Meadow.
Santa Cruz clover <i>Trifolium buckwestiorum</i>	-- / -- / List 1B	Margins of broadleaved upland forests and coastal prairie	Present Observed at Cusack's meadow.

Federal Categories (USFWS)

FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FSC = Federal Species of Concern (former Category 2 Candidate)

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California but more common
List 3 = Plants about which more information is needed
List 4 = Plants of limited distribution

State Categories (CDFG)

CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California

Present = Species observed within the Park

High Potential = Species expected to occur and meets all habitats as defined in list

Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range

Low Potential = Habitat absent or only marginally suitable habitat is present

APPENDIX C

SPECIAL-STATUS SPECIES

For the purposes of this document, special-status species are defined by the following sources:

- the California Native Plant Protection Act (Fish and Game Code § 1900 *et seq.*) protects endangered and “rare” species, subspecies, and varieties or plants;
- the California Endangered Species Act lists plants and wildlife as threatened or endangered (Fish and Game Code § 2070);
- the Federal Endangered Species Act, the Secretary of Commerce, and the Secretary of the Interior list plants and wildlife as threatened or endangered (16 USC. § 1533[a]; 16 USC § 1533 [a] [2]; 16 USC § 1533 [c] [1]);
- CEQA Guidelines, Section 15380, includes plants and wildlife that may be considered rare or endangered if the species meets certain specified criteria;
- the California Native Plant Society (CNPS) lists plants as rare, threatened, or endangered;
- the California Department of Fish and Game designates plants and wildlife as “species of special concern” and prohibits the destruction of nests and eggs of any bird (Section 3503);
- the Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading of migratory non-game birds;
- the California Fish and Game Code (Sections 3511 [birds], 5050 [reptiles and amphibians], and 4700 [mammals]) designates listed wildlife as fully protected in California;
- the federal Bald Eagle Protection Act (16 USC § 668 *et seq.*) prohibits persons within the United States (or places subject to U.S. jurisdiction) from “possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or golden eagle, alive or dead, or any part, nest, or egg thereof;
- “Special Animals” is a general term that refers to all taxa the CDFG Natural Diversity Data Base (NDDB) tracks, regardless of their legal or protection status. The term does not offer further protection beyond the legal or protection status that may apply; and the California Fish and Game code (Section 4800) designates the mountain lion (genus *Felis*) as a specially protected mammal. It is unlawful to take, injure, possess, transport, import, or sell mountain lions or any part or product thereof, except as specially provided.

